

THE ONLY ABSTRACTING SERVICE  
ON INDIAN FISHERIES

ISSN 0970 - 6879



# INDIAN FISHERIES ABSTRACTS

Volume 27

No. 1

January-March 1988

CENTRAL INLAND CAPTURE FISHERIES RESEARCH INSTITUTE  
BARRACKPORE, WEST BENGAL





# **INDIAN FISHERIES ABSTRACTS**

*The only Abstracting Journal in India covering all aspects of Fisheries*

Volume 27 No. 1

January-March 1988

***Compiled and Edited by*** : V. V. Sugunan  
G. K. Vinci  
V. K. Unnithan

***Abstracted By*** : P.K. Chakraborty

***Bibliographic details &  
Indexing*** : Anjali De  
Dipankar Chatterjee  
Rina Basak

***Typing*** : Swapna Talapatra

---

***Published by: Arun G. Jhingran Director CICFRI Barrackpore***

**A Service from the Library and Documentation Section of  
The Central Inland Capture Fisheries Research Institute  
(Indian Council of Agricultural Research)  
Barrackpore 743 101 West Bengal INDIA**





# INDIAN FISHERIES ABSTRACTS

(Indian Fish. Abstr.)

## CONTENTS

I.	ENTRIES	...	1-49
II.	AUTHOR INDEX	...	AI - AVI
III.	SUBJECT INDEX	...	SI - SIII
IV.	TAXONOMIC INDEX	...	TI - TIII
V.	SERIAL INDEX	...	S1 - S2







## ENTRIES

1. Alagaraja, K. (1983).

Central Marine Fisheries Research Institute,  
Cochin-682031.

Mathematical models in fish stock assessment.  
J. mar. biol. Ass. India, 25(1&2):142-157.

This paper attempts to enumerate various models for fish stock assessment, which are till date deterministic and are considered for macro and micro-analytical models for unit stock. Extension of such models for multi species has been indicated. Stochastic models has also been presented in the paper.

... 75 ref.

2. Anon (1988)

India may start artemia culture.

Fish. Eng.Int., 15(3): 32p.

This paper reports about the arrangement for the visit of experts from Artemia Reference Centre, Belgium to examine feasibility of establishment of brine shrimp culture centres at Tamil Nadu and Andhra Pradesh to cater the needs of shrimp hatcheries especially of those two established in Orissa and Andhra Pradesh by the MPEDA. This is likely to improve socio-economic condition of ~~parijans~~ <sup>peasants</sup> of the Kavalam-Kelampakkam area.

3. Anon (1987)

Siltation of reservoirs.

Aquaworld, 11(6): 179-180.

This paper deals with the quantum of silt load in reservoirs in India which is about a tenth of 6000 million tonnes of top soil erosion. Maximum silt deposit has been recorded at Bhakra, Hirakud, Tungabhadra and Mahi. This paper also refers about the silt load in the rivers Mahanadi, Ganga and Brahmaputra. A reference also has been made about soil conservation in the catchments of River Valley Projects.



4. Awasthi, Ajoy K. & Smita Singh, 1987.

School of Environmental Biology, APS  
University, Rewa-486001, India.

Effects of DDT & BHC on green algae

Spirogyra cylindrica.

Environ. & Ecol., 5(4): 814-815.

Spirogyra cylindrica was found to be sensitive to low concentration of DDT & BHC while 25 and 30 ppm were found to be toxic. The effect of DDT was more severe. This paper reports that pesticides inhibit algal growth and cause cell abnormalities.

... 4 ref.

5. Banerjee, Subrata & V. Banerjee. 1987.

Hematology Laboratory, PG Department of  
Dept. of Zoology, Patna University,  
Patna-800 005, India.

Variations in some biochemical constituents of blood in the fishes Heteropneustes fossilis and Rita rita in relation to body length sex and season.

Environ. & Ecol., 5(4): 621-624.

Reports that glucose and cholesterol in H. fossilis decrease and in Rita rita increase during summer, rainy and winter seasons with increase in body length. Protein content decreased with increase in length excepting for H. fossilis during rainy season. The rate of increase or decrease varied with the sex and species.

... 13 ref.

6. Beena, S. & S. Viswaranjan, 1987.

Post Graduate and Research Dept. of  
Zoology, APA College of Arts and Culture,  
Palani-624602, India.

Effect of cadmium and mercury on the hematological parameters of the fish Cyprinus carpio.

Environ. & Ecol., 5(4): 726-730.

Cyprinus carpio exposed to cadmium nitrate (24 ppm) and mercuric chloride (0.30 ppm) for 90 hrs. showed decrease in erythrocyte count, hematocrit and haemoglobin content and increase in erythrocyte sedimentation rate, hepatosomatic index and number of immature erythrocyte. Counts of leucocyte and thrombocyte and blood clotting time did not change after exposure. Hematological parameters restored on transfer of the fish to tap water. Mercuric chloride was more toxic than cadmium nitrate.

... 18 ref.



7. Beevi, M. Razia & S. Radha Krishnan 1987.  
Dept. of Aquatic Biology and Fisheries,  
University of Kerala, Trivandrum-695007,  
India.  
Haematological effects of sublethal concentration  
of formalin on Sarotherodon mossambicus (Peters)  
Proc. Indian Acad. Sci., 96(6):721-725.  
Reports that exposure to 80 ppm formalin for  
24 hrs, lowers erythrocyte counts and increases haemoglobin  
and haematocrit in Sarotherodon mossambicus. Thus, macrocytosis  
and hyperchromia occurred. ... 9 ref.
8. Bharathan, Geeta 1986.  
Central Marine Fisheries Research Institute,  
Centre, Madras-600105.  
A simple technique for estimating cell  
densities in outdoor mass cultures of  
phytoplankton.  
Indian J. Fish., 33(2):225-228.  
A simple method, involving a sechi-disc  
has been proposed to estimate cell density of cultured phyto-  
plankton to be used as food in mass rearing of fish and prawn  
larvae. This method is significant at 1% level when formulae  
for estimates are given by:-  
For brown tank  
Cell density =  $54.51 - 12.67 \times \text{disc disappearance depth}$   
Cell density =  $48.01 - 6.86 \times \text{central triangle disappearance depth of the disc.}$   
For white tank corresponding values  
Cell density =  $42.76 - 7.69 \times \text{disc disappearance depth}$   
Cell density =  $46.29 - 11.53 \times \text{central triangle in disc disappearance depth.}$   
... 8 ref.
9. Bhowal, S.K., A.K. Chakraborty & Bhabani Dhar  
Dept. of Chemistry, Jadavpur Univ.,  
Calcutta-700032.  
Heavy metal contamination in the sewage  
sludge of Calcutta metropolitan area.  
Indian J. Environ. Hlth., 29(1):66-71.



Heavy metal content of Calcutta sewage sludge from 15 cites have been reported. Significant amount of Ph, Cu, Zn, Ni, Co, Cr and Mn has been detected in the samples and the sources for these metals have been tentatively traced. The mean values of the respective metals were 11.65-190.64, 20.07-248.20, 62.24-809.19, 23.19-46.50, 10.95-16.32, 25.35-405.95 and 272.37-444.01 mg/kg. ... 9 ref.

10. Chakrabarti, P. & G.M. Sinha 1987.

Zoology Dept., Burdwan Univ., Burdwan-713104.  
Mucosal surface of the alimentary canal in Mystus vittatus (Bloch): a scanning electron micropic study.

Proc. Indian natn. Sci. Acad., 53(4): 317- 322.

Describes histological aspects of buccopharyngeal mucosa in Mystus vittatus along with mucosal layers in stomach and intestine. Anatomical structures of the mucosal layers have been correlated with the food habit.

... 14 ref.

11. Chakraborti, R.K., M.L. Bhrownick and D.D. Halder 1986.

CICFRI, Barrackpore.

Effect of change in salinity on the survival of Penaeus monodon (Fabricius) post larvae.

Indian J. Fish., 33(4): 484-481.

Indicates results of direct change in salinity between 3 and 30 ppt. on P. monodon post larvae which survived reasonable (76 to 10%). During a gradual change of salinity from 5 to 0.5 ppt., the survival was satisfactory (68%) up to 2 ppt., but below 2 ppt. the survival was very poor.

... 5 ref.

12. Chakraborty. S.K. & P.V. Kagwade 1986.

Bombay Research Centre of Central Marine Fisheries Research Institute, Bombay.

Chromosome counts of Nibea semiluctuosa and Johnius belangerii (Pisces: Sciaenidae)  
Indian J. Fish., 33(1): 115-118.



Based on tissue preparation under colchicine-citrate aceto-methanal-air dry technique from kidney, intestine, stomach and gills somatic chromosomal counts of Nibea semiluctuosa and Johnius belangerii have been made. Both the species gave a diploid chromosome count of 48 and they were acrocentric.

... 8 ref.

13. Chennubhotla, V.S.K., N. Kaliaperunial, J.R. Ramalingam & S. Kalimuth 1986.

Mandapam Regional Centre of CMFRI Institute, Mandapam Camp.

Growth reproduction and spore output in Gracilariaopsis sjoestedtii (Kylin) Dawson around Mandapam.

Indian J. Fish., 33(1): 76-84.

Seasonal growth changes, reproduction and spore output of Gracilaria foliifera and Gracilariaopsis sjoestedtii from Mandapam area have been reported. Two species showed maximum growth in April and in September as well as January-March respectively. Tetrasporophyte were abundant than carposporophytes in the former species where reverse was the case for the other algae. Output of spores were recorded and maximum shedding was during peak growth.

... 15 ref.

14. Dasmahapatra, A.K. & A.K. Meddah 1982.

Seasonal variation in protein and nucleic acid contents of liver muscle and ovary of female singhi fish (Heteropneustes fossilis Bloch) in relation to ovarian growth.

Bangladesh J. Fish., 2-5(1-2): 1-4.

Seasonal variation of protein, RNA & DNA in liver, muscle and ovary of Heteropneustes fossilis female and their correlation with each other have been dealt with Rainfall and temperature influenced ovarian changes. During spawning season (June to August) protein, RNA, DNA contents and HSI & GSI were maximum and during November to March least.

... ref 46



15. Datta, N.C. & Sukanta Banik 1987.  
Fishery and Ecology Research Unit,  
Dept. of Zoology, University of  
Calcutta, Calcutta-700 019.  
Periphytic community on glass slide  
substrata in a freshwater lake in  
relation to some abiotic factors.  
Proc. Indian natn. Sci. Acad., 53(3): 245-247.  
The influence of temperature, transparency,  
pH, carbon dioxide, dissolved oxygen, alkalinity, dissolved  
organic matter, specific conductivity, phosphate-phosphorus  
and nitrate nitrogen on the abundance of periphytic community  
of Rabindra Sarobar during March 1984 to February 1986.  
Correlations between periphyton abundance and transparency  
as well as specific conductivity were significant as ANOVA  
showed the regression to be significant. ... 11 ref.
16. Davis, T.A. 1987.  
JBS Jaldane Research Centre, Nagercoil-  
4, Tamil Nadu.  
Dextral and sinistral coiling in  
gastropod molluscs.  
Proc. Indian natn. Sci. Acad.,  
53(4): 323-327.  
Reports that though dextral coiling in  
gastropods are common, Amphidromus, Achatinella and Parlues  
exhibit reverse coiling of shells also. Data on these genera  
reveal that for left shell coiling, genetics, long isolation  
and influence of ecosystem are important. The classical  
breeding experiments with Limnaea peregra are reported. ... 13 ref,
17. De, D.K., D. Nath & P.R. Sen 1986.  
CICFRI, Barrackpore.  
Preliminary trials on trials on  
transport of fry of Hilsa ilisha  
(Hamilton).  
Indian J. Fish., 33(4): 481-484.  
Deals with the details about transport  
of hilsa fry (20-60 mm) at a density of 5-10 nos. per litre  
of water from Dhatrigam to Barrackpore covering 2-6 hours  
journey by jeep when water temperature was 23°-33°C. It  
was noticed that transport under closed oxygen packing showed  
higher mortality than transporting in open container, thus  
disproving that DO is the main factor for better survival.  
... 10 ref.



18. Desai, Prakash, V. 1987.

Biology Dept., Dhempe College of Arts and Science, Panaji, Goa, India.

The effect of mining on the lotic and lentic environments of Goa b.\*Poll.res., 6(2): 87-90.

Provides an assesment of pollution in Mayem lake (Goa) for the period, June 1985 to June 1986. This lake receives washings from mining sites. Pollutational studies have been based on bacterial and phytoplankton populations. Bacterial load especially of Escherichia coli and Aerobacter aerogenes are high and plankters are represented by 57 species of Cyanophyceae, 5 of Chlorophyceae and 68 of Bacillariophyceae.

... 13 ref.

19. Desai, Prakash V. 1987.

Biology Dept. Dhempe College of Arts and Science, Panaji, Goa, India.

The effect of mining on the lotic & lentic environments of Goa-(C).

Poll. res., 6(2): 87-90.

Effect of mining on Mayem lake in Goa has been described. In all 43 extra aquatic fungal forms have been recorded with maximum in December and minimum in April, being dominated by Aspergillus sp., Curvularia sp., and Fusarium sp. Extra aquatic fungi showed maximum alkaline phosphatase activities in December.

... 19 ref.

20. Devaraj, M. 1986.

CIFE, Versova, Bombay-400 061.

Maturity spawning and fecundity of the streaked seer, Scomberomorus lineolatus (Cuvier & Valenciennes), in the Gulf of Mannar and Palk Bay.

Indian. J. Fish., 33(3): 292-319.

Twelve finer maturity stages (A to L) of Scomberomorus lineolatus have been described. Stage A showed bimodal ova size frequency distribution. Advanced mode took double time than that the preceding mode formation except for stages G to H when the growth of advanced mode was five-times. Most of the ova ripened at J stage while the second batch of ova ripened at K stage, resembling the advanced mode of G stage. Like the growth of G to H, the remaining ova matured abruptly at L stage. The growth from B to J took 75 days and from J to L, 21 days. Gonad index for seperating spawning and nonspawning females was 3 at 441-480 mm length and 5 at 961-1000 mm length groups. Two year old fish (700 mm) showed first maturity.

... 7 ref.



21. Dewan, A.D. & Krishnan L. (1986).  
Central Marine Fisheries Research Institute,  
Cochin-682 031.  
Levels of cholesterol in blood serum and gonads  
in relation to maturation in Etroplus suratensis  
(Bloch).  
Indian J. Fish., 33(2): 241-245.

The paper describes that the fluctuating blood serum cholesterol is the highest when GSI is low and the lowest when GSI is high in E. suratensis. The gonad cholesterol in male showed similar trend but in female gonad cholesterol though high is not the highest at low GSI.

... 14 ref.

22. Dwivedi, S.N.<sup>1</sup>, G. Gopalakrishna<sup>2</sup> & P. Ranu Reddy<sup>2</sup> 1985.

1. Central Institute of Fisheries Education,  
Bombay.

2. Brackish water Fish Farm of the CIFE,  
Kakinada.

Tiger prawn production: low input technology  
demonstrated.

Fishing Chimes, 4(11): 31-34.

The paper describes the technology for P. monodon production at a low cost (i.e. at Rs. 188.50 for the 1st crop and at Rs. 166.50 for the 2nd crop in a 0.08 ha pond) leading to a profit of Rs. 2744/yr through an experiment. The experimental details along with physico-chemical parameters of the pond water have also been discussed.

23. Felix, S. & N. Sukumaran (1987).

Aquarium keeping an art.

Aquaworld, 11(6): 188p.

This paper deals with the details of setting up of aquarium and short description of fishes suitable for aquarium, giving emphasis on their maintenance.

24. Ghatak, D.B., Md. M. Hassain & S.K. Konar 1987.

Dept. of Zoology, Kalyani University,  
Kalyani-741 235., India.

Acute toxicity of mixture of heavy metal  
cadmium and pesticide phosphamidon to plankton,  
worm and fish.

Environ. & Ecol., 5(4): 751-755.



Reports that the exposure of plankton, worm and Tilapia massambica to the mixture of cadmium and phosphomidon records 0.04 to 1.10, 1.00 to 13.5 and 800 to 900 ppm respectively as  $LC_{50}$  to  $LC_{95}$  values. Exposure to higher concentration showed erratic movement, loss of equilibrium, irregular opercular movement in fish which exuded sticky thread like faeces. The mixture was more toxic to plankton and worm than to fish. High concentration of the mixture fragmented worm and arrested activities in plankton.

... 19 ref.

25. Ghosh, S., T.K. Jana, B.N. Singh & A. Chaudhury 1987.  
 Dept. of Marine Science, University of  
 Calcutta, 35-B.C. Road, Calcutta-700 019.  
 Comparative study of carbon dioxide system  
 in virgin and reclaimed mangrove waters of  
 Sundarbans during freshet.  
Mahasagar, 20(3): 155-161.

Diurnal changes in temperature, salinity, DO,  $pCO_2$ ,  $HCO_3^-$ ,  $CO_3^{2-}$  and ionic products of calcium carbonates have been recorded at Saptamukhi and Muriganga mangrove waters during monsoon. Surface water was unsaturated with respect to  $O_2$  and partial pressure of  $CO_2$  remained high. Calcium/chlorinity values were lower than those in sea. Considering high  $pCO_2$  and changes in calcium/chlorinity ratio between day and night, the possibilities of dissolution of calcium carbonate were examined.

... 19 ref.

26. Ghosh, T.K. 1987.  
 Dept. of Zoology, University of Kalyani,  
 Kalyani-741 235.  
 Effects of organophosphorus compound on some  
 metabolic levels of the fish Barbus stigma.  
Environ. & Ecol., 5(4): 638-642.

Reports that Barbus stigma exposed to sublethal concentrations of organophosphates (nuvan, ekalux and suquin) developed hyperglycemia, depressing FFA levels and glycogenolysis in liver and skeletal muscles, probably for some cellular disorganisation.

... 23 ref.



27. Ghosh, T.K. 1986.

Dept. of Zoology, Kalyani University,  
Kalyani-741 235.

Nuvan induced physiological, biochemical and  
behavioural, changes in Barbus stigma.

Poll. res., 5(2): 63-68.

The paper describes the effect of sublethal concentrations of Nuvan on Barbus stigma. Behavioural changes like surfacing, distance travelled tremors, convulsions and high opercular movements accompanied by fall in feeding rate, predation capacity, swimming ability etc. have been noticed and details have been recorded. Rate of growth retardation lowering of respiratory rate, have also been described along with biochemical changes in protein, lipid and sugar contents.

... 48 ref.

28. Goel, P.K., S.D. Khataavkar, A.Y. Kulkarni & R.K. Trivedy 1986.

Dept. of Environmental Pollution, Y.C. College of Science, Kerd -415 110, Maharashtra, India. Limnological studies of a few freshwater bodies in south western Maharashtra with special reference to their chemistry and phytoplankton.

Poll. res., 5(2): 79-84.

Reports about the study of water chemistry and phytoplankton of five reservoirs, three ponds, one tank and a lake in S.W. Maharashtra. Phosphorus, nitrogen, total alkalinity and chloride indicated very high eutrophication as these water bodies were affected by pollution. Microcystis sp., Euglena sp., Oscillatoria sp., Scenedesmus sp. and Nitzschia sp. were tolerant and dominant species of such polluted waters.

... 13 ref.

29. Gopinathan, C.P. 1986.

Central Marine Fisheries Research Inst.,  
Tuticorin.

Differential growth rates of micro-algae in various culture media.

Indian J. Fish., 33(4): 450-455.



Growth and multiplication of algae, Isochrysis galbana, Tetraselmis chunii and Nitzschia closterium have been reported on the basis of laboratory culture. Uniform culture media could not be established for different algae as they required supplementation of the media by suitable trace elements and vitamins.

... 12 ref.

30. Guha, Dhriti & Dilip Mukherjee 1987.

Dept. of Zoology, University of Kalyani,  
Kalyani-741 235, India.

Testicular cholesterol dynamics and its interrelationship with circulatory cholesterol in the common carp Cyprinus carpio Linn.  
Indian J. Exp. Biol., 25(12): 822-825.

Interrelationship between plasma and testicular cholesterol of C. carpio response to season and gonadotropins has been investigated. Non-esterified cholesterol of both testis and plasma fluctuated seasonwise. Application of one homologous pituitary extract/100 g body weight and ovine LH or salmon gonadotropin at 1  $\mu$ g/100 g. body weight depleted non-esterified cholesterol in plasma and testis. Ovine FSH had no such effect while the effect of gonadotropin was not noticeable enough.

... 30 ref.

31. Habibnia, B.A. & M.S. Mannikeri 1988.

Dept. of Geology, Karnataka University,  
Dharwad-580 003, India.

Additional recent ostracodes from Rajasthan.  
Curr. sci., 57(1): 33-34.

Records 10 species of ostracodes viz., Cypis subglobosa, Sclerocypris jaini, Hemicypris fossulata, Stenocypris hislopi, Ilyocypris mckenziei, Ihyocypris bradyi, Hemicypris sp., Hemicypris pandei, Parastenocypris sp. and Potamocypris minuta patriciae from two perennial ponds (Kawadisar and Bhumsar) in the north of Jaisalmer. Former five species are known from Rajasthan but the latter five species are new records. The paper also provides information about the distribution of these species of in different geological substrate.

... 5 ref.

32. Hameed, M. Shahul & N.K. Sasidharan Pillai 1986.

Dept. of Industrial Fisheries Cochin University  
of Science and Technology, Cochin-682 016.



A new species of caligus (copepoda: caligidae)  
from Kerala.

Indian J. Fish., 33(4): 487-492.

Describes and illustrates a new species,  
Caligus Zylanica collected from Caranx sansun (Forsk.)..

... 4 ref.

33. Hameed, P. Shahul & A.L. Paulpandian 1987.

Post Graduate Dept. of Zoology, Jamal  
Mahamed College, Tiruchirapalli-620020.

Feeding and extracellular digestive rhythms  
in some intertidal bivalve molluscs.

Proc. Indian Acad., Sci., (Anim Sci.).,  
96(6): 667-672.

The tidal rhythms for changes in morphology,  
length, dry weight and protein content of crystalline styles  
have been studied for Meretrix meretrix, Katelaysia opima  
and Donax cuneatus. In venerids style housed in sac conjoined  
with mid gut showed changes with tidal rhythms but  
in donocid where style sac is seperated from midgut.

... 16 ref.

34. Hassain, Md. M., D.B. Ghatak & S.K. Konar 1987.

Dept. of Zoology, Kalyani University,  
Kalyani-741 235.

Acute toxicity of mixture of a non-ionic  
detergent alkaline FI and an organic pesticide  
DDVP to fish, plankton and worm.

Environ. & Ecol., 5(4): 778-781.

Reports that the LC<sub>5</sub> and LC<sub>95</sub> of the mixture  
of pesticide DDVP and detergent alkaline FI range from  
< 1.00 to 38.60 ppm for fish, < 0.01 to 0.326 ppm for  
plankton and < 1.00 to 95.50 ppm for worm. The mixture was  
more toxic than the toxicants. Fish showed erratic movement  
and exuded reddish brown faecal matter while its body became  
slimy at high concentration. Likewise in high concentration  
of the mixture plankters lost swimming ability and worms lost  
their posterior part.

... 17 ref.



35. James, P.S.B.R. & M. Badrudeen 1986.

Central Marine Fisheries Research Institute,  
Cochin.

Studies on the maturation and spawning of  
the fishes of the family Leiognathidae from  
the seas around India.

Indian J. Fish., 33(1): 1-26.

The paper deals with maturation and spawning  
of 17 species of Leiognathids from Indian coast. Majority  
spawn over a prolonged period, a few over a short period but  
continuous while the rest in batches in quick succession over  
a short period. Fecundity in L. bindus, G. minuta, S. insidiator  
increased with length at higher rate but in L. berbis, L.  
brevirostris, L. daura & S. ruconius decreased with length  
at low rate. In L. leucisous. L. splendens fecundity  
decreased with length. Pooled equation for fecundity was  
 $Y = 0.00745 \times 3.0202$ .

... 9 ref.

36. <sup>1</sup>Jana, Sasadhar & <sup>2</sup>Kakali Ghosh 1987.

1. Prant Physiology and Biochemistry,  
PG Dept. of Botany, Darjeeling Govt.  
College, Darjeeling-734 101, India.

2. Dept. of Zoology, Visva Bharati  
Univ. Santiniketan-731 235, India.

Effect of heavy metals on population growth  
of a fish nematode Spinicauda spinicauda  
in aquatic environment.

Environ. & Ecol., 5(4): 811-813.

Hg, As, Pb, Cu, Cd and Cr. at 0.5 to 5 mg/l  
reduced infection of Spinicauda spinicauda in the intestine  
of Channa punctatus. The order of heavy metal toxicity to  
nematode was  $Cd > Pb > Cu > As > Hg > Cr$ .

... 10 ref.



## 37. Jayabalan, N (1986).

Centre of Advanced Study in Marine Biology,  
Parangipettai-608 502.  
Reproductive biology of silver belly  
Leiognathus splendens (cuvier) at Porto Novo.  
Indian J. Fish., 33(2): 171-179.

The paper describes that L. splendens of Porto Novo coast breeds throughout the year, showing two peaks during October-January and April-May when high GSI corresponded well with spawning. In female GSI is higher than in male during spawning but the relative condition did not show any bearing on reproductive cycle. Maturity is attained at 76-111 mm in female and 81-111 mm in male. Males dominates the breeding population. Fecundity is between 7099 and 21507 and appears to increase with the fish length. ... 13 ref.

## 38. Jayaraman, R. (1988).

Status and prospects of brackishwater  
aquaculture.

Fishing Chimes, 8(9): 21-27.

The paper deals with the status of brackish water aquaculture in Orissa, profitability of prawn culture, brackishwater environment, prawn feed, fish & fish seed resources in Orissa, prawn seed resources, feeding habits of prawn and dietary needs, results of feeding experiments, rehabilitation through prawn culture, prawn productions in different blocks, demand for snail farming, central aid for a fishing harbour, etc.

## 39. Jayasankar, P.

Central Marine Fisheries Research Inst.,  
Mandapam Regional Centre, Mandapam Camp.  
Harmful effects of ammonia and nitrite  
on the Indian white prawn.  
Green & Glory, 2(1): 31- 33.

Exposure of Ponazuscindicus nauplius to 10 mg/l of ammonia or nitrite is fatal as evident from the hatchery trials. At lower concentration in sea, nauplius and protozoal deformities are obvious, leading to poor growth and slow death. In normal sea water NH<sub>3</sub> & NO<sub>2</sub> concentrations (0.11 & 0.08 mg/l) are not harmful.<sup>2</sup>

...



40. Joseph, Antony & V.C. Soni 1986.

Dept. of Bio-sciences, Saurashtra University,  
Rajkot-360 005.

Length-weight relationship and relative  
condition factor of prawn Metapenaeus  
kutchensis (George, George & Rao) from  
Okha (Gujarat).

Indian J. Fish., 33(1): 27-129.

The paper deals with length weight relation  
ship ( $\log W = -28.79 + 2.94 \log L$  in male and  $\log W = -28.79 + 3.35 \log L$  in females) which was significant at  $P 1\%$   
( $r = 0.95$  for male and  $r = 0.94$  for female. Relative condition  
factor (Kn) showed highest peak during maturation.

... 7 ref.

41. Joshi, S.N. (1987).

P.G. Dept. of Zoology, Govt. Post-graduate  
College, Gopeswar (Chamoli)-246 401.

Size relationship of oocytes their nuclei  
and nucleolus in two fresh water fishes.

Sci. & Cult., 53(9): 281-282.

With gonodial maturity, the size of oocyte  
and nucleus increases and of nucleolus decreases in Labeo  
gonius and Schizothorax richardsonii, though the number of  
neucleolii increases. Observations made in this paper shows  
that neucleolus and nucleus are active in early growth of  
oocytes.

... 7 ref.

42. Kaliaperumal, N., S. Kallianuthu, J.R. Ramalingam & M. Selvaraj,  
1986.

Division of soil Science, Sher-e-Kashmir  
University of Agricultural, Sciences and  
Technology, Shalimar Srinagar-Kashmir, India.

Experimental field cultivation of Acanthophora  
spicifera in the nearshore area of Gulf of  
Mannar.

Indian J. Fish., 33(4): 476-480.

Gives results of red alga, Acanthophora spicifera  
culture through vegetative propagation. Fragments of 5 cm length  
reached 15.9 cm for harvest in 25 days, registering 2.6 fold  
increase in weight. Nearshore area of Hare Island was found to  
be suitable for alga culture.

... 4 ref.



43. Kasim, H. Mohamad (1986).

Research Centre of Central Marine Fisheries  
Research Institute, Tuticorin.  
Effect of salinity temperature and oxygen  
partial pressure on the respiratory metabolism  
of Panulirus polyphagus (Herbst).  
Indian J. Fish., 33(1): 56-75.

Lethal O<sub>2</sub> level, time to death, total O<sub>2</sub> consumption and the metabolic rates in Panulirus polyphagus have been estimated at different salinity, temperatures and O<sub>2</sub> partial pressure (such as 17, 32, 39 and 50 ppt., 22.5°, 22.1°, 28.1° and 20.1°C, etc.). ... 14 ref.

44. Kasim, H. Mohamad & Mohammad Zafarkhan 1986.

Central Marine Research Centre, Veraval.  
A preliminary account of the gillnet fishery  
off Veraval during 1979-82.  
Indian J. Fish., 33(2): 155-162.

Reports about gill net fishery of Veraval which did not improve with increased fishing effort in 1979-82. Contributions by elasmobranch ipeids, pomfrets, Chiro entrus spp., sear fish, cat fish, tuna, ribbon fish and carangids were 26.0, 25.8, 11.1, 8.8, 7.6, 5.6, 3.2, 3.0 and 3.0% respectively. The fishery is good at the beginning and end of the season. Increasing trends have been shown by Hilsa toli, Parastromateus nigar, Chirocentrus dorul, Scomberomerus guttatus and carangids. ... 8 ref.

45. Khan, A.K., K. Sambasiva Rao, Sabiha Alam, M.U. Patil, R. Nagabhushanam & R. Sarojini 1987.

Dept. of Zoology, Marathwada Univ.,  
Aurangabad-431 004.  
Respiratory response of the freshwater crab,  
Barytelphusa cunicularis exposed to two



Effect of petrol (6.5 ml/l) and diesel (4.3 ml/l) on the oxygen consumption by Barytelphusa cunicularis after 1, 4, 8, 12 and 24 hrs. exposure and of 4.1 ml/l and 2.4 ml/l concentrations respectively on the same crab after 48, 72 and 96 hrs. has been discussed. Under former concentrations of hydrocarbons, O<sub>2</sub> consumption increased upto 12 hrs exposure followed by a sharp fall at 24 hrs. However, greater respiratory disturbance was noticed after 72 hrs. exposure to latter concentrations of the two hydrocarbons. ... 8 ref.

46. Khan, Iqbal A. 1986.

Dept. of Zoology, Aligarh Muslim Univ.,  
Aligarh, U.P.

A note on the limnology of the Baigul reservoir  
Uttar Pradesh.

Indian J. Fish., 33(1): 119-123.

Reports that water level of Baigul reservoir shows inverse relationship with temperature while transparency and DO show direct relation ship. Higher bicarbonate is due to absence of free CO<sub>2</sub>. Monthly variation in CO<sub>3</sub><sup>-2</sup> concentration and pH has been noted to follow similar trends. Chloride content has been observed to be low in the reservoir.

... 8 ref.

47. Khan, Mohammad Zafar 1986.

Bombay Research Centre of CMFRI, Bombay.

Mortality and stock-size estimates of the  
Bombay duck, Harpodon nehereus (Ham.) off  
Nawabunder, Gujarat.

Indian. J. Fish., 33(3): 354-358.

Total mortality rate of H. nehereus at Nawabunda varied from 2.443 to 2.939 during 1976-79 while natural mortality was at 1.575 for unexploited phase and 1.462 for the exploited phase. The exploitation rate ( $e$ ) was 0.422 and the MSY and average yield were 3918.4 t and 3561.0t respectively.

... 12 ref.



48. Khillare, Y.K. & S.B. Wagh 1987.

Dept. of Zoology, Marathwada Univ.,  
Aurangabad-431 004, India.

Acute toxicity of the pesticide endosulfan  
to fishes.

Environ. & Ecol., 5(4): 805-806.

The paper deals with the toxicity of endo-  
sulfan to Barbus sigma, Channa gachua, Ophicephalus punctatus  
and Clarias batrachus at different temperatures, water hard-  
ness and pH. The 96-hr. LC50 ranged from 0.000193 to 0.002775  
ppm. Toxicity to these fishes increased at higher pH.

... 8 ref.

49. Khillare, Y.K. & S.B. Wagh 1987.

Dept. of Zoology, Marathwada University,  
Aurangabad-431 004, India.

Levels of free amino acids in the brain and  
muscle of freshwater fish Barbus ticto.

Environ. & Ecol., 5(4): 802-804.

Glutamic acid has been referred to be  
32.34% mg/g of tissue in the brain and histidine to be  
42.88% mg/g of muscle tissue in Barbus ticto.

... 10 ref.

50. Kongovi, R.R., F.G. Dandarathimath & S.J. Markande 1987.

Dharwad Dist., Karnataka.

Pollution and its effects caused by industries  
on the Tungabhadra river.

Encology, 2(7): 13-18.

The paper reports about the pollution in the  
Tungabhadra river by polyfibre factory and its effect on fish  
fishermen and washermen. It gives the detailed list of vari-  
ous reports on the Tungabhadra river pollution hinting how the  
control measures remained unimplemented in an effective manner.  
It also reports about non-functioning of the effluent plant,  
though the pollutional hazards are evident from the river  
water quality

51. Krishna, Kumar P.K. 1987.

C.M.F.R.I., Karwar.

Mussel watch - a recent trend in marine pollution monitoring.

Green & Glory, 2(1): 25-27.

Deals with the method of detection of environmental pollution in sea by the use of mussel as indicates species in which accumulation of pollutants and physiological changes are recorded for the assessment of ambient waters through back calculations.

52. Krishnamoorthi, B. & I. Jagadis. 1986.

Central Marine Fisheries Research Institute, Centre, Madras-600 105.

Biology and population dynamics of the grey dogshark, Rhizoprionodon (Rhizoprionodon) Acutus (rappell) in Madras waters.

Indian J. Fish., 33(4): 371-385.

Thirteen morphometric characters of 105 specimens of Rhizoprionodon acutus have been discussed. The Von Bertalanffy growth curve based on samples from Madras revealed  $t_0 = 1.78$  yrs.,  $K=0.2$  and  $L = 100$  cm. The fish recorded 417.3, 522.9, 609.4, 680.2, 738.2, 785.6, 824.5, 856.3, 882.3 and 903.7 mm respectively at 1 to 10 years of age. Details about length-weight relationship, sex ratio, sizes at maturity, total mortality (2), fecundity, recruitment etc. have been discussed. ... 31 r-f.

53. Krishnan, T. & T. Kannupandi 1987.

Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai-608 502.

Larval development of the mangrove crab Sesarma bidens (De man, 1853) in the laboratory (brachyura : grapsidae : seserminae).

Mahasagar, 20(3): 171-181.



Developmental stages upto megalopa stage of Sesarma bidens (the mangrove crab) reared in the laboratory at  $25 \pm 1\%$  salinity and  $28^\circ \pm 1^\circ\text{C}$  have been discussed. First zoea reached megalopa stage in 4 moults in 10 days. Four zoeal and a megalopal stage have been compared with other known larvae of various Sesarma spp. ... 7 ref.

54. Kumari, K., R.P. Singh & S.K. Saxena 1987.

Dept. of Botany, Faculty of Life Sciences,  
Aligarh Muslim University, Aligarh-202 002.  
Effect of cobalt, manganese and nickel cations  
on the movement of different amino acids in silt  
loam soil.

Proc. Indian natn. Sci. Acad., B53(3): 262-266.

The effect of Co(II), Mn(II) cations on the movement of monocarboxylic, dicarboxylic, basic, aromatic and sulphur-containing amino acids has been reported in silt loam soil using thin. layer chromatography. The mobility of amino acid was lower in Ni(II) followed by Co(II) and Mn(II) amended soils. The results have been based on absorption, solubility, stability, ionic radii, complexation and chelation of amino acids with metal ions. ... 7 ref.

55. Kumar Kuldip 1987.

Govt. of Himachal Pradesh, Khalini,  
Shimla-171 002.

Observations on seasonal variations of benthic organisms in two trout streams of Kashmir.

Proc. Indian. natn. Sci. Acad., 53(3): 227-234.

The paper embodies seasonal variations of benthos in the Sind and the Lidder streams. Benthos densities in the respective streams were 63 and  $116 \mu/\text{m}^2$  and the major constituent insect composed nymphs of Phemeroptera and Plecoptera, larvae of Trichoptera, Diptera, and larvae and adults of Coleoptera. The dominant species have been recorded and major orders of Insecta has been correlated with the physico-chemical factors of the streams. ... 14 ref.

56. Kurup, N. Surendranath 1986.

CMFRI Centre, Calicut.

On the prawn fishery by trawlers off Purakad, SW coast, during 1972-76.

Indian J. Fish., 33(3): 362-365.

Reports that prawn fishery off Purakad declined from 1972 to 1976 excepting in 1974, registering a fall from 2000t to 200t in the landings. Though all species declined, P. indicus declined steeply from 29% to 6% against an unusual increase in M. dobsoni from 52% to 72%.

... 4 ref.

57. Lazarus, S. & K. Nandakumaran 1986.

CMFRI Centre, Calicut.

Some observations on the growth and spawning behaviour of the common pearlspot in the polyethylene lined ponds at Calicut.

Indian J. Fish., 33(3): 365-370.

In the poluthene-film lined ponds at Calicut, E. suratensis has yielded an instantaneous growth rate varying between 0.01168 and 0.02262 and spawned like those in a normal culture system, though the production and survival rates have been comparatively low. The paper emphasises that such a water body can be used effectively for culture and hatchery purposes in raising fish seed.

... 2 ref.

58. <sup>1</sup>Mahadevan, Anandhavalli & <sup>2</sup>S. Krishnaswamy 1986.

1. School of Energy, Environment and Natural Resources, Madurai Kamraj Univ., Madurai-625021.

2. School of Biological Sciences, Madurai Kamraj University, Madurai-625 021, India.

Self purification capacity of river Laigai (South India).

Poll. res., 5(2): 69-72.

The paper assessed the level of reduction of coliforms, oxygen demanding wastes and total solids in the river Vaigai (S. India) through self purification. The factors responsible for the purification have been discussed.

... 22 ref.



## 59. Manisseri, Matry, K.

Central Marine Fisheries Research Institute,  
Cochin-682 031, India.

On the fishery of Penacus semisulcatus and  
its distribution in relation to depth  
along Tinnevely coast, Southern India.  
Indian J. Fish., 33(4): 402-412.

Reports about the catch statistics of P. semisulcalus from Tinnevely coast which is underexploited. The breeding, recruitment, etc. have been dealt with. Three grounds (Paltanamarudur-Tuticorin, Punnaikkayal and Manappad) with 0-2, 8-20 and 15-30 m depths have been surveyed. Juveniles preferred shallow waters. Whereas adult preferred deeper areas. Mean sizes of male and female prawns from shallow waters were 89.1 and 90.5 mm and modal values from the 2nd and 3rd grounds were 110-150 and 120-180 mm, and 140-160 and 160-210 mm respectively. Maturing females were recorded from deeper areas.

... 11 ref.

## 60. Mathew, K.J. 1983.

Central Marine Fisheries Research Inst.,  
Cochin-682 031.

Studies in larval euphausiids from the  
southwest coast of India with notes on the  
their developmental pathways and breeding  
seasons.

J.mar.biol.Ass.India, 25(1&2): 51-70.

This paper provides the details of studies  
on the post-naupliar stages of Euphausiids (Psendeuphausia latipons, Euphausia diomedea, E. tenera, Nematoscelis gracilis, Stylocherion armatum and S. affine) collected from the plankton of the South West Coast of India. Larval abundance has been highlighted with respect to months, recording breeding seasons of five species.

... 42 ref.

## 61. Menon, N. Gopinatha 1986.

Central Marine Fisheries Research  
Institute, Cochin-682 031.

Age and growth of the marine catfish

Tachysurus thalassinus (Ruppell)

Indian J. Fish., 33(4): 413-425.

Reports about age and growth determination of Tachysurus thalassiness from Mandapam using six different methods (Lenth-frequency, probability-plot technique, operculum, pectoral spine, vertebra and actual rearing) and records 251.3 - 260.9, 345.5 - 360, 436.5 - 454 and 522 mm for I, II, III and IV year classes by various means. The embryos showed faster growth in controlled aquaria. Von Bertalanffy equation for the species is given by  $L_t = 848.5 (1 - e^{-0.19885(t-0.8113)})$ .

... 13 ref.

62. Misra, A & N.C. Nandi 1986.

Zoological Survey of India, Calcutta.  
A new host record of Cymothoa indica  
Schioedte and Meinert (Crustacea:Isopoda)  
from Sundarbans, West Bengal.  
Indian J. Fish., 33(2): 229-231.

Reports that out of 240 S. strongylura examined at Bakkhali and Sagar Island, 215 specimens were infected with parasitic isopod, Cymothoa indica during September-November in 1979-83. No other host for the parasite could be detected in the Sundarbans. The parasites were all gravid female (13.8 - 19.0 mm) and infected the buccal cavity of 14-23 cm long fishes.

... 6 ref.

63. Mitra, Krishna & Kuldip Kumar 1988.

CICFRI, Barrackpore-743101.  
Common insects of freshwater ponds and  
their control.  
Bull. Cent. Inland Fish. Res.Inst.,  
Barrackpore No.54, 27.

Based on survey of freshwater ponds at Barrackpore, 42 insect species belonging to 7 orders have been reported. Short description of each for ready identification along with 33 figures have been put forth for illustrations. A brief description about the control devices of these aquatic insects has also been presented.

... 25 ref.



64. Mohan, C.V., T.R.C. Gupta & N.R. Menon 1956.  
College of Fisheries, Mangalore-575 002.  
Acute toxicity of mercury on the early  
development stages of Cirrhina mrigala  
(Ham).  
Indian J. Fish., 33(1): 133-136.

Describes results of static bioassay  
trial with C. mrigala a test fish taking different develop-  
mental stages. 20h LC<sub>50</sub> for embryos, 48h LC<sub>50</sub> values for  
hatchlings and 3-day old fry have been recorded to be 0.17,  
0.21 and 0.16 ppm of mercury toxicity. 2 month old fry has  
been observed to be more sensitive than earlier stages.

... 2 ref.

65. Mohan, Madan, C.S. Gopinath Pillai & K.K. Kunhikoka 1986.  
Central Marine Fisheries Research  
Institute, Cochin.  
Biology of the bluepuller Chromis  
caeruleus (Cuvier), from Minicoy atoll.  
Indian J. Fish., 33(4); 457-470.

The paper deals with Chromis caeruleus,  
an important live-bait for tuna, from Laskhadeep lagoons.  
The species is diurnal in habit and an active plankton  
feeder, showing no selectivity in its diet. Separate length  
weight relationships for juveniles and adults have been  
reported. In the 1st and 2nd years, the fish attains 64 and  
95 mm length showing growths @ 5.3 mm/month and @ 2.6 mm/  
months respectively. Proportionately female population  
decreased. Fecundity was 4000-8000 eggs and female spawning  
more than once a year attained first maturity at 38 mm  
length. Active breeding season is 9 months but at Minicoy  
it breeds round the year. The planktonic phase lasts for  
2 to 3 weeks then settles on corals as post larvae (8 mm  
size).

... 11 ref.

66. Mollalv, M.F.A. 1986.

School of Biological Sciences, University of Science, Penang, Malaysia.

Cyclic changes in the ovary of freshwater catfish Clarias macrocephalus (Gunther).

Indian J. Fish., 33(1): 54-65.

The paper describes histologically 7 stages of oocyte maturation in Clarias macrocephalus. These stages are related to 6 morphological stages. Cyclic changes involving oogonial multiplication, formation of new oocytes, growth of oocytes, vitellogenesis in different months have also been reported.

... 29 ref.

67. Molly, M.P. 1987.

C.M.F.R.I.

Packing of prawns for export.

Green & Glory, 2(1): 36-37.

Deals with the packing procedure for exporting prawns to various countries, covering the aspects like, weighing, polypacking, arranging, glazing, freezing inserting within carton (duplex) then in master carton for export.

...

68. Mukhopadhyay, P.K., B. Venkatesh & P. Das 1986.

Central Inland Capture Fisheries Research Institute, Barrackpore-743101.

Growth and some biochemical changes in Clarias batrachus due to methyl testosterone.

Indian J. Fish., 33(3): 262-269.

Clarias batrachus given feed containing methyl-testosterone at 0.0, 1.0, 2.5, 5.0 and 10.0 mg/kg for 63 days showed higher growth and protein efficiency ration upto the dose of 5.0 mg/kg and then declined. Feed conversion was better at low dose of MT. At 1.0-2.5 mg/kg dietary MT, the hormonal effect through incorporations of l-leucin U-H<sub>c</sub> intolimer protein aided in sustenance of enhanced growth rate and better feed conversion.

... 14 ref.



69. Muley, P.V. & U.H. Mane 1987.

Dept. of Zoology, Marathwada University,  
Aurangabad-431 004, India.

Histopathological changes induced by cythion-  
malathion in the gonads/Lamelli branch ~~in~~/ of  
mollusc.

Environ. ecol., 5(4): 756-759.

Lamellidens corrianus and L. marginalis from  
the river Godavari at Paithan were exposed to cythion-  
malathion 50 EC at  $LC_0$  &  $LC_{50}$  concentrations for 96 hours  
in summer, monsoon and winter seasons. Histopathological  
investigation showed deep penetration of pesticides into  
the gonadal follicles, affecting the molluscs severely.

... 17 ref.

70. Murty, V. Sriramachandra 1986.

Central Marine Fisheries Research Institute,  
Kakinada.

Growth and yield per recruit of Johnius  
(Johnius) carutta Bloch in the trawling  
grounds off Kakinada.

Indian J. Fish., 33(2) :163-170.

The paper deals with the estimation of growth  
parameters of Jhonius carutta from trawl catches at Kakinada  
during 1980-83. Estimated  $L_{\infty}$  was 333.3 mm; K, 0.44/yr and  
 $t_0$ , -0.0002 year. The values of Z, M and F were 5.07, 1.0  
and 4.07 respectively. It was estimated that the yield  
could be raised by increasing cod-end mesh size of the  
trawl nets.

... 14 ref.

71. Murty, V. Sriramachandra 1986.

Kakinada Research Centre of CMFR Institute,  
Kakinada -533 002.

Studies on the growth and population dynamics  
of silver belly Leiognathus bindus (  
(Valenciennes) in the trawling grounds off  
Kakinada.

Indian J. Fish., 33(3): 277-284.

Reports that Leiognathus bindus from Kakinada  
Bay attains average lengths of 72, 110 and 132 mm in the  
1st, 2nd and 3rd years respectively. Estimated  $L_{\infty}$ , K and  
 $t_0$  were 158.4 mm, 0.58/yr and -0.024 year respectively,  
while the values of Z, M and F were estimated to correspond  
with 5.2, 1.5 and 3.7. The yield could be increased by  
raising cod-end mesh size of trawl.

... 12 ref.

72. Muthu, M.S., A. Laxminarayana & K.H. Mohamed 1986.  
Central Marine Fisheries Research Institute,  
Cochin-682 018.  
Induced maturation and spawning of Penaeus indicus without eyestalk ablation.  
Indian J. Fish., 33(2): 246-250.

The paper gives information about induced maturation of P. indicus (732.5 mm carapacial length, > 150 mm T.L. and 25g wt.) by maintaining pH of the pool water at 8.1-8.2 by adding Na<sub>2</sub>CO<sub>3</sub> in the recirculated sea water. 61.8% prawns matured and 81% of spawning yielded healthy larvae. The average eggs per female was 119,614 and the average hatching rate was 82.5%.

... 12 ref.

73. Muthu, M.S., K.H. Mohamed, N.N. Pillai, A. Laxminarayana & S.K. Pandian 1986.

Central Marine Fisheries Research Institute,  
Cochin-682 031.

On the advantages of domestication of the  
Indian white prawn, Penaeus indicus.  
Indian J. Fish., 33(1): 129-133.

Reports about domestication of P. indicus at Narakkal through breeding in captivity and rearing them to all the stages. Five successive generations have been raised. The paper also points out the advantage of such domestication over the conversional culture of the prawn.

... 6 ref.

74. Naidu K. Rajendra Prasad, J. Pramoda Kumari & B.P. Naidu 1987.

Dept. of Zoology, Sri Venkateswara University  
Tirupati-517 502, India.

Impact of endosulfan on the hematology of  
the fish Cyprinus carpio.  
Environ. & Ecol., 5(4): 713-716.

Reports that exposure of C. carpio to sublethal (1/3 LC<sub>50</sub> for 96 hrs.: 0.64 µg/l) and lethal (LC<sub>50</sub> for 96 hrs.: 1.93 µg/l) concentrations of endosulfan altered haematological indices after 24 hrs. Progressive increases in RBC, Hb and PCV followed by reduction in MCV, MCH & MCHC were noticed.

... 21 ref.



75. Nair, K.V. Somasekharan & A.A. Jayaprakash. 1986  
Central Marine Fisheries Research Institute,  
Cochin-682 031.  
A note on the monsoon fishery for the threadfin  
breams off Cochin.  
Indian J. Fish., 33(1): 106-112.

Reports the fluctuation of Nemipterus japonicus and N. mesoprion landings from shrimp trawls off Cochin. The catch of these threadfin bream was the highest during SW monsoon and they were recorded mainly from 75-100 m depth but found to migrate to 35-40 m depth during monsoon, coinciding well with upwelling shift of population with hydrographic conditions have been reported.

... 19 ref.

76. Nair, M.R. 1983.  
Central Institute of Fisheries Technology,  
Cochin-682 029.  
Problems and programmes for post harvest technology  
development in fisheries.  
J. mar. biol. Ass. India, 25(1&2): 109-112.

This paper deals with the utilisation of a fish processing industry especially for marine product. Gives idea about the status of exported commodities in fisheries and how diversification of such products can be made, emphasising on canning and other products like dried, smoked and pickled ones besides shark fins and oils. The paper also suggests how processing wastes can be utilised.

77. <sup>1</sup>Nair, P.V.R. & <sup>2</sup>V.K. Pillai 1983.  
1. 27, North Wirinagar, Cochin-682 020.  
2. Central Marine Fisheries Research Institute,  
Cochin-682 031.  
Productivity of the <sup>1</sup>Indian seas.  
J. mar. biol. ass. India, 25(1&2): 41-50.

This paper reviews the works on primary productivity of the Indian coasts. This includes ecological studies the estuaries, mangrove swamps, coastal areas and upwelling zones besides results of various expeditions. In the communication emphasis has been laid on factors affecting production, and the relation between productivity and potential yield of fish.

... 43 ref.

78. Nair, S.R. Sreekumaran 1987.

National Institute of Oceanography, Dona Paula, Goa-403 004.

In vitro fertilization of banana prawn

Penaeus merguensis De Man.

Mahasagar.

20(3): 187-190.

Reproduction of P. merguensis under captivity including artificial insemination through sperm and ova mixing has been dealt with. Production of healthy naupli (42%) on the following day and subsequently mysis (28.5%) on the 10th day has been reported from the NIO laboratory.

... 16 ref.

79. Naluchinnapan, I. 1985.

Freshwater Biological Station, Bhavanisagar 638 451, Tamil Nadu.

Promising river prawn culture at Bhavanisagar.

Fishing chimes, 4(11): 20-22.

The paper reports about M. malcolmsoni culture in eastern ponds at Bhavanisagar. The production of prawn with animal feed was 385 kg/ha/132 days and with vegetable feed, 250 kg/ha/147 days. The common carp raised in the same ponds to control Spirogyra sp. gave production: 817 kg/ha/102 days and 410 kg/ha/102 day respectively. Month-wise growth has also been reported.

... 5 ref.

80. Nanaware, S.G. & Rex Harold 1987.

Dept. of Zoology, Shivaji University, Kolhapur-416 004, India.

Toxicological studies on the undesirable fishes in pisciculture using toxins of the indigenous plants from Western ghat of India.

I. Effect of Lasiasiphon eriocephalus (decasine) leaves toxin on dissolved oxygen and physiology of Tilapia mossambica (Peters).

Poll.res., 6(384): 51-54.

Reports that the use of Lasiosiphon

eriocephalus leaf toxin does not deplete DO of the ambient water but impedes O<sub>2</sub> uptake by the gills causing haemorrhage and heavy secretions of mucus. Laboratory trial with tilapia showed that the toxin at sublethal dose affects the fish physiologically changing its behaviour.

... 11 ref.



81. Naomi, T.S. 1986.

CMFRI, Cochin-31.

On the zooplankton of the inshore waters of Karwar during 1980-81.

Indian J. Fish., 33(3): 336-346.

Karwar coast showed good standing stock of holoplankton in 1980-81, in addition to frequent swarms of meroplankton. Numerical abundance and biomass showed bimodal distribution in a year with peaks during March-April and September-October. The first peak was due to holo and mero-plankton, both but the second one was due to spurts of Evadre tergestina and Penilia avirostris. During SW monsoon, salinity temperature, zooplankton abundance declined when a minor fishery devoid of mackerel existed, but after ward everything improved gaining a height in Summer through replacement of cladoceran by copepods.

... 12 ref.

82. <sup>1</sup>Ninawe, A & <sup>2</sup>S. Banik 1987.

1. CMFRI, P.O. Box No. 2704, Cochin-682 031, India.

Chitinolytic bacteria in Penaeus indicus.  
J. Aqua. Trap., 2: 89-92.

Quantitative distribution of chitinolytic bacteria from the hepatopancreas, stomach and intestine of Penaeus indicus has been reported. These bacteria were isolated and identified. Eighteen of them belonged to the genus Vibrio and seven of them to the genus Pseudomonas.

... 11 ref.

83. Pandey, Anita, Gopal Krishna Kunwar & J.S. Datta Munshi 1987.

Ichthyology Laboratory, P.G. Department of Zoology, Bhagalpur University, Bhagalpur-812 007.

Comparative study of the gill surface area of Hilsa ilisha (Ham.) and a major carp Labeo rohita (Ham.).

Proc. Indian natn. Sci. Acad., 53(3): 205-214.

The paper deals with comparative anatomy of gills in H. ilisha and L. rohita from the river Ganga. Hilsa ilisha had lesser number of shorter filament but greater gill area than those of Labeo rohita of the same body weight.

... 31 ref.

84. Panigrahi, A.K. & S.K. Konar 1987.  
 Dept. of Zoology, Kalyani University,  
 Kalyani-741 235, India.  
 Sublethal effects of mixture of petroleum  
 refinery effluent and anionic surfactant  
 parnal J on fish.  
Environ. & Ecol., 5(4): 736-740.

Describes the effect on Tilapia mossambica  
 exposed to the mixture of petroleum refinery effluent and  
 anionic surfactant parnal J for 90 days. At 6.43 and 12.86%  
 concentration of effluent and 1.01 mg/l of surfactant caused total fish  
 total fish mortality. Reduction of growth rate, maturity  
 indices and fecundity were observed. GSI increased with the  
 treatment but condition factor was not affected.

... 21 ref.

85. Patel, R.I., M.N. Prasad & A.P. Mansuri 1986.  
 Dept. of Biosciences, Saurashtra  
 University, Rajkot-360 005.  
 Length-weight relationship and relative  
 condition in the Penaeid penaeus  
 (Penicillatus) (Alcock).  
Indian J. Fish., 33(1): 112-115.

Length weight relationship of Penaeus  
pencillatus from Mindsar estuary has been reported to be  
 $\log W = -4.5623 + 2.71 \log L$ , being significant ( $r=0.97$ ;  $P 1\%$ ),  
 the fluctuating condition factor showed peak value during  
 spawning and trough during cyclic gonadal development.  
 The prawn attained maturity at 66-70 mm length.

... 9 ref.

86. Patil, S.G. & P. Panda 1986.  
 Freshwater Biological Station, Zoological  
 Survey of India, 1-1-300/B,  
 Ashoknagar, Hyderabad-500 020.  
 Impact of factory effluents on the water  
 quality and biota of Pedda  
 Hyderabad, Andhra Pradesh.  
Poll. Res., 5(2): 57-61.



The paper deals with the water quality of Peddacheru tank near Hyderabad. The water of the tank is polluted by the effluents of starch factory and washings of cloth, faecal matter, laboratory and hospital toxic materials. Reports that aquatic vegetations are decreasing but Eichhornia crassipes is covering 50% of the surface water. Depletion of fish population has been recorded. Along with a biotic features of the tank, the details of plankton and benthos have been worked out.  
... 16 ref.

87. Paulose, P.V. 1987.

Dept. of Zoology, University of Rajasthan  
Jaipur-302 004.  
Accumulation of organic and inorganic mercury  
and histological changes in the gills of  
Gambusia affinis.  
Proc. Indian natn. Sci. Acad., 53(3): 235-237.

Accumulation of Hg in the body and histological changes in gills have been reported after exposure of Gambusia affinis to sublethal  $\text{HgCl}_2$  and  $\text{CH}_3\text{HgCl}$  separately for 45 days. Changes in the gills were similar in both the cases. Accumulation rate of Hg decreased in the later part of exposure but histological damage persisted.

... 20 ref.

88. Paul Raj, Samuel 1986.

School of Energy, Environmental and Natural  
Resources, Madurai Kamraj University,  
Madurai-625 021, India.  
Mercury pollution in river Cauvery, Tamil  
Nadu, India.  
Poll. res., 5(2): 39-43.

Reports that chloralkali plant near Mettur Dam pollutes the Cauvery river with mercury. The maximum Hg concentrations in water and mud have been recorded to be 0.0364 and 4.36 ppm respectively.

... 7 ref.

89. Philipose, K.K. 1987.

C.M.F.R.I., P.O. Vizhinjam, Trivandrum,  
Pin-595 521.

Mussel farming.

Green & Glory, 2(1): 28-30.

Culturing methods, growth, harvesting, and marketing of green mussel Perna viridis have been described. The protein and fat content in mussels have been recorded as 59 and 8% respectively. Culture period required for marketable size of mussels has been noted to be 5 months.

... 1 ref.

90. Pillai, S. Krishna 1986.

Mandapam Regional Centre of CMFR Institute,  
Mandapam Camp.

The relative magnitudes of pelagic and demersal groups of fishes in the total landings at Sasoon Dock in 1971 and 1981 - a comparison.

Indian J. Fish., 33(3): 359-361.

Describes landings of fishes at Sasoon Dock in 1971 and 1981. Pelagic fishes declined from 31.4% in 1971 to 18.1% of the total in 1981, for fall in Bombay duck. Naturally demersal fishery increased in the catch of penaeids, sciaenids, elasmobranchs, catfishes, threadfin brems and cephalopods. This changes was due to additon of trawlers in lieu of dal-nets.

... 2 ref.

91. Ponnuchamy, R., S. Ravichandra Reddy & Katre Shakuntala 1987.

Dept. of Zoology, Bangalore University,  
Jnana Bharathi, Bangalore-560 056, India.  
Experimental studies on the hatching rhythm and larval release in palaemonid and atyid prawns.

Proc. Indian Acad., Sci., 96(6): 647-655.

The hatching behaviour and larval release of Macrobrachium lanchesteri and Caridina weberi are described in relation to natural and altered laboratory illumination cycles. Female H. lanchesteri releases the larvae in batches on successive nights till all eggs are exhausted. Breeding occurs between 24 to 03 hrs. In Caridina weberi such a precise rhythm is loosely operative.

... 22 ref.



92. <sup>1</sup>Prakash, Shree & <sup>2</sup>G.P. Agarwal 1986.

1. Central Inland Capture Fisheries Research Institute, Park Road, Allahabad.

2. Dept. of Zoology, Banaras Hindu University, Varanasi-221 005.

On the recruitment and abundance of juveniles of the freshwater prawn Macrobrachium birmanicum choprai in the middle stretch of the river Ganga. Indian J. Fish., 33(3): 285-292.

The paper deals with the distribution of Macrobrachium birmanicum choprai from the river Ganga between Varanasi and Patna. Variations in abundance at sixteen selected centres were noted, taking larval number per collection as the index. Chisquare test found to be significant. The results have been discussed in the light of other accounts for palaemonids.

... 5 ref.

93. Prasad, G.V.R. 1987.

Dept. of Geology, University of Jammu, Jammu, India.

Squamules of osteoglossid fish form the intertrappean beds of Pargi, Andhra Pradesh.

Curr. Sci., 56(24); 1270-1272.

Morphologically variable isolated plates of osteoglossid scales have been reported from the intertrappean beds of Pargi, Andhra Pradesh and are considered to have close affinities to the genus Phareodus.

... 9 ref.

94. Ramakrishniah, M. 1986.

Reservoir Fisheries Project of CIFR Institute, Nagarjunasagar.

Studies on the fishery and biology of Pangasius pangasius (Hamilton) of the Nagarjunasagar reservoir in Andhra Pradesh. Indian J. Fish., 33(3): 320-335.

Reports that Pangasius pangasius landing at Nagarjunasagar is 51.7 t/yr during 1976-80. Average length is much below the length at maturity (above 630 mm). The main age groups are III, IV & V year classes while in the VI yr class females dominated. The growth rates between the sex are not significantly different but the length-weight relationship differed. Single mode of mature eggs is found in mature ovary. This omnivorous fish feeds preferably on molluscs but consuming other items only in want.

... 18 ref.

95. <sup>1</sup>Ramanibai, P.S. & <sup>2</sup>S. Ravichendran 1987.

1. Dept. of Zoology, Life Sciences Building, University of Madras, Madras-600 025, India.
  2. Dept. of Zoology, Presidency College, Madras-600 005. India.
- Limnology of an urban pond at Madras, India.  
Poll. res. 6(2): 77-81.

The results of studies on physical & chemical aspects and on plankton for a tilapia pond in Madras Presidency College have been discussed. A little eutrophication has been recorded and the richness of biota was noticed for rather physical features and not for nutrients so much.

... 20 ref.

96. Ramaswamy, M. 1987.

Dept. of Zoology, Govt. of Arts College, Coimbatore-641 018, India.  
 Effects of sevin on blood free amino acid levels of the fish Sarotherodon mossambica.  
Environ. & Ecol., 5(4): 633-637.

Acute exposure of S. mossambicus to sublethal (3 ppm) and lethal (25 ppm) of sevin caused marked decrease in blood free amino acid which was proportional to the time of exposure. This was due to withdrawal of blood free amino-acid in the active tissue used for compensatory metabolites in energy production or for incorporation of extra protein synthesis needed for detoxifying enzymes at pesticide stress.

... 13 ref.



97. Ram, Rajnarayan & A.G. Sathyanesan 1987.  
 Dept. of Zoology, Banaras Hindu University,  
 Pin-221 005, India.  
 Effect of chronic exposure of commercial  
 nitrogenous fertilizer ammonium sulfate,  
 on testicular development of a teleost  
Channa punctatus (Bloch).  
Indian J. Exp. Biol., 25(10): 667-670.

Reports that C. punctatus exposed to 100  
 and 500 ppm  $(\text{NH}_4)_2\text{SO}_4$  suffered from testicular abnormalities,  
 inhibiting spermatogenesis and reducing gonadosomatic index.  
 Correlative changes occurred in the pituitary. Testicular  
 damage at 500 ppm appeared permanent from histological studies.

... 21 ref.

98. Rao, D. Manikyala & K. Srinivasa Rao. 1986  
 Dept. of Zoology, Andhra University  
 Waltair, Andhra Pradesh.  
 Studies on the age determination and  
 growth of Nemipterus japonicus (Bloch)  
 off Visakhapatnam.  
Indian J. Fish., 33(4): 426-439.

Age composition of Nemipterus japonicus  
 from trawl catches at Vishakhapatnam has been determined on  
 the basis of scales and length frequency and has been reported.  
 Bianual rings (one for poor feeding during January to March  
 and another for maturation and spawning during August to  
 October) on the scales have been recorded. The weighted mean  
 lengths have been observed to be 9.58, 12.22, 14.32, 16.11,  
 17.43 and 18.60 cm respectively at the end of 6, 12, 18, 24,  
 30 and 36 months. The maximum age and length of the fish  
 was noticed to be 3 years and 23.1 cm. 0-year and 1-year  
 classes dominated. Best fitted Gompertz curve showed L  
 and K values to be 21.96 cm and 0.6244.

... 15 ref.

99. Rao, K. Seshagiri, K. Sreenivasa Moorthy, B. Kasi Reddy,  
 K.S. Swami & C. Sreeramulu Chetty 1987.  
 Dept. of Zoology, Sri Venkateswara Univ.,  
 Tirapathi-517 502, Andhra Pradesh.

Effect of benthocarb on protein metabolism of freshwater teleost, Sarotherodon mossambicus.

Indian J. Environ. Hlth., 29(1): 45-51.

Gives estimates of the levels of protein, free amino acid and activities of proteases in S. mossambicus exposed to benthocarb an organ carbamate pesticide. At sub-lethal dose, protein (soluble and insoluble) decreased with increase in free amino acid content. Similarly protease activities also increased in the tissue.

... 23 ref.

100. <sup>1</sup>Rao, S. Seeta Ram & <sup>2</sup>K.V.N. Rao 1987.

1. Dept. of Botany, P.G. College of Science, Osmania University, Saifabad, Hyderabad-500 004.

2. Dept. of Botany, Osmania University, Hyderabad-500 007.

Effect of certain flavones on the growth, nucleic acid and nitrogen contents of Lemna paucicostata hegelm.

Proc. Indian natn Sci.Acad., B53(3):267-271.

Effects of 11 substituted flavones on the growth, nucleic acid, and nitrogen content of Lemna paucicostata have been reported. Flavones increased growth (weight and number) of plants but not at higher concentrations. Treatment did not change DNA content. Alcohol soluble -amino nitrogen was lower than protein nitrogen. The growth regulation through nucleic acid and nitrogen metabolism has been discussed.

... 20 ref.

101. Ravindran, K. & K.S. Swami 1987.

Dept. of Zoology, Sri Venkateswara Univ., Tirupati-517 502, India.

Effect of DDT exposure on some physical parameters of the body and on tissue cations of the fish Tilapia mossambica.  
Environ. & Ecol., 5(4): 651-654.

Reports that exposure of Tilapia mossambica to sublethal DDT decreases body weight density, water content, oxygenconsumption rate, and levels of Na, K and Ca.

... 16 ref.



102. Reddy, H.R. Venkataswamy & V. Hariharan 1986.

College of Fisheries, Mangalore.

Distribution of Nutrients in the sediments of the netravathi-Gurpur estuary, Mangalore.

Indian J. Fish., 33(1): 123-126.

The distribution of sediment nitrogen, phosphorus, organic carbon and interstitial salinity has been reported over an annual cycle in Netravathy-Gurpur estuary, Mangalore. The concentrations ranged from 32-1134 g/g for N, tr to 20  $\mu$ g/g for P, 0.24-3.46% for organic C and 131.2-629 mg cl/100 g soil for interstitial salinity. The sediment had more sand and less silt and clay.

... 9 ref.

103. Reddy, M. Srinivasulu, S. Ghouselazam, T. Ramesh Babu & K.V. Ramana Rao 1987.

Division of Toxicology, Dept. of Marine Zoology  
SV University PG Centre, Kavali-524 202, India.

Changes in respiratory potentials of the penaeid prawn Metapenaeus monoceros exposed to phosphamidon, DDT & fenvelerate.

Environ. & Ecol., 5(4): 643-646.

Changes in the respiratory potentials of Metapenaeus monoceros has been reported after exposure to sublethal concentration of phosphomidon, DDT and fenvelerate. O<sub>2</sub> consumption in prawn increased, glycogen, succinate dehydrogenase malate dehydrogenase and cytochrome-c-oxidase levels in mid-gut glands and muscle tissues decreased after exposure level. Organochlorides were more effective than organophosphate and synthetic pyrethroids.

... 14 ref.

104. Reddy, M. Vikram & B. Malla Rao 1987.

Environmental Biology Laboratory, Dept. of Zoology, Kakatiya University, Warangal-506 009, Andhra Pradesh.

Structure of benthic macro-invertebrate populations particularly the tubificidae and chironomid larvae in a sewage polluted urban canal.

Poll. res., 6(2): 65-68.

Pollutional effect of sewage affected Hanamakonda canal in Warangal city has been described. Higher density of Tubificidae than Chironomidae indicated higher intensity of sewage, suggesting thereby the ratio of Tubificidae to Chironomidae to be an index of pollution. Type of vegetation infestation has also been cited.

... 11 ref.

105. Reddy, P.K. & T.J. Lam 1987.

Dept. of Zoology, National University of Singapore, Kent Ridge, Singapore-0511  
Effects of salinity and thyroxine on larval survival and growth in the dwarf gourami, Colisa lalia.  
J. Aqua. Trap., 2: 79-87.

Improved survival has been reported after treatment of Colisa lalia larvae with 0.05 ppm thyroxine (Eltroxin) which accelerated the growth also. Larval rearing was taken up with diluted sea water at 1.4, 2.8, 4.2 and 5.6% salinity and the best survival and growth were recorded at 2.8%. Addition of Eltroxin at 0.01-0.02 ppm in diluted sea water at 2.8‰ salinity though improved the survival further, did not boost the growth rate any more. Treated larvae proved better than those reared with freshwater.

... 10 ref.

106. Reddy, T. Mahender & V. Lakshmipathi 1988.

Dept. of Zoology, University College, Kakatiya University, Warangal-506 009.  
Esterases in Amblypharyngodon mola.  
Curr. Sci., 57(1): 24-27.

Esterase pattern in skeletal muscle, brain and liver tissue of Amblypharyngodon mola has been discussed. Physostigmine, pCMB, paraoxon and DFP have been used to classify the esterases into different categories.

... 16 ref.



107. Roy, P.K. & J.S. Datta Munshi 1987.  
University Dept. of Zoology, Bhagalpur Univ.,  
Bhagalpur-812 007.  
Diffusing capacity (oxygen uptake efficiency)  
of gills of a freshwater major carp,  
Cirrhinus mrigala (Ham.) in relation to  
body weight.  
Proc. Indian natn. Sci. Acad., 53(4):  
305-316.  
Water-blood diffusion barriers and diffusing  
capacity of gills in C. mrigala have been estimated. In a  
100±5 g fish, barrier varied from 0.675 to 3.423  $\mu\text{m}$ . In  
Pillar cells comprise 12.52% area and 10.016% volume.  
Diffusion capacity increase by a power of 0.8158 and de  
creased by a slope value of -0.1842 for unit increase  
in weight. The resistance in water is more than in tissue.  
... 35 ref.
108. Roy, R.N., S.S. Maiti & C.R. Mondal 1987.  
Freshwater Fisheries Research Station,  
Kulia, Kalyani, India.  
Control of aquatic insects of fish nursery  
ponds by the insecticides metacid and  
hexidole.  
Environ. & Ecol., 5(4): 807-808.  
Provides information that zooplankton and  
spawn tolerate Hexidole at 5-6 ppm while at 1-2 ppm Anisops  
sp. is eradicated. Similarly tolerance limit of metacid  
for zooplankton and fish spawn is 0.5 ppm and the lethal  
limits for Anisops sp. are 0.1 ppm for 9-10 hrs and 0.2 ppm  
for 2-3 hours. Toxicity of water to insect persisted for  
7 days in a nursery where retrieval of spawn was 60% after  
their release on the 3rd day of application of the insecticides.  
... 2 ref.
109. Sampath, K. & R.T. Srithar 1987.  
Dept. of Zoology, V.O. Chidambaram  
College, Tuticorin-628 008, Tamil Nadu.  
Studies on the effects of feeding frequency  
on food intake and production in Penaeus  
monodon.  
J. Aqua. Trop., 2: 127-132.

Food intake and production pattern in P. monodon has been presented in relation to feeding frequency and it has been reported that improved results were obtained by increasing the feeding rate upto 2 times/day. The meal size declined with increased feeding frequency and the quantity was just double at 2 times/day feeding than those at 3 or 4 times/day. Gross maximum efficiency of production was 39%. At low frequency for feeding, meal size increased, conversion improved and metabolic loss went down.

... 13 ref.

110. **Sarkar, S.K.** 1988.

Dept. of Zoology, Netaji Nagar Day College,  
Regent Park, Calcutta-700 040.

Experimental study on addition of super-phosphate and mahua oil cake for increased yield from fish ponds.

Proc. Indian . Acad. Sci., 97(1): 89-96.

Reports that the use of single super-phosphate @ 500 kg/ha removes deleterious effect of mahua oilcake (2000 kg/ha) treatment in a fish pond, and improves survival, growth, fecundity-weight relation in Cyprinus carpio, keeping ammonia level of the ambient water in order.

... 30 ref.

111. <sup>1</sup>Sarwar, S.G. & <sup>2</sup>D.P. Zutshi 1987.

1. Hydrobiology Research Laboratory,  
S.P. College, Srinagar-190 001.

2. Centre of Research for Development,  
University of Kashmir, Srinagar.

Studies on periphyton population of Himalayan lakes. I. species composition and community structure on natural and artificial substrates.  
Proc. Indian. natn.Sci.Acad., 53(3):239-243.

Species composition, seasonal changes and population dynamics of periphytons from Dal, Anchar and Waskur lakes have been discussed. A total of 2114 taxa representing six classes were recorded with dominating Chlorophyceae with 99 taxa. Percentage composition of diatoms was the highest. Settling on natural and artificial substrates was similar. Ecology of these lakes varied.

... 28 ref.



112. Sasikala, S.L. & T Subramoniam 1987

Dept. of Zoology, University of Madras.

On the occurrence of acid mucopolysaccharides in the spermatophores of two marine prawns, Penaeus indicus (Milne-Edwards) and Metapenaeus monoceros (Fabricius) (Crustacea: Macrura).

J. Exp. Mar. Biol. Ecol., 113(2): 145-153.

This paper reports the occurrence of acid mucopolysaccharides in spermatophores of Penaeus indicus and Metapenaeus monoceros. AMPS fractions corresponded to chondroitin sulfate and hyaluronic acid. Quantitative assay revealed AMPS content to be 195.50  $\mu$ g/mg in the spermsac of P. indicus and to be 43.68  $\mu$ g/mg in the wing of the sperm. Qualitative and quantitative variations in AMPS of two prawns, in relation to sperm attachment in the thelycum sperm storage till fertilization have been discussed.

... 17 ref.

113. Satya Mohan, K. 1987.

Dept. of Botany, N.B. Science College,  
Hyderabad-500 002, India.

Chemistry of two freshwater lakes of  
Hyderabad, India -silicates.

Poll.res., 6(2): 69-72.

Describes the chemical aspects of the waters of Osman Sagar and Mir Alam in Hyderabad for the period 1977-78. Silicate content was higher in older lake, Mir Alam, showing dissolved component to be 91-27% of the total silicate. Osman Sagar showed higher particulate form of silicates posing a threat for the lake in the long run.

... 21 ref.

114. Shree Prakash & R.A. Gupta 1986.

Central Inland Fisheries Research Inst.,  
Allahabad-211 002.

Studies on the comparative growth rates of  
three major carps of the Govindgarh lake.

Indian J. Fish., 33(1): 45-53.

Comparative growth rates of catla rohu and mrigal have been reported from the Govindgarh lake by means of scale studies. The relationship of fish length and scale length and time of annuli formation have also been estimated. Age wise instantaneous and absolute growths have been noted. Months of peak and lean growths have been recorded. The affected growth curve for 1st year class was due to intensity of feeding and for adults due to feeding and maturation.

... 9 ref.

115. Shyamsunder 1986.

Srinagar Research Centre of CIFRI, Harvan-191123, Kashmir.

On the breeding biology of snow trout Schizothorax longipinnis from the river Jhelum Kashmir.

Indian J. Fish., 33(2): 201-210.

Based on ova diameter-frequency polygons and the largest mode in the diameter-distributions of ova, 7 maturity stages have been fixed for Schizothorax longipinnis from Jhelum. About 50% fish mature at 250 mm length. Fecundity per kg body weight is 41,355. Relative fecundity vary between 25 and 71 ( $X = 45$  ova). Relationships between fecundity and other variables are also reported.

116. Singh, R.K. 1985.

Taraporevala Marine Biological Research Station, Netaji Subhas Road, Bombay-400 002. Significance of hydrobiological studies in aquaculture.

Fishing Chimes, 4(11): 17-19.

The importance of physio-chemical aspects of water bodies has been discussed for fish production. Role of temperature on tilapia and exotic carps, source and effect of turbidity importance of pH, DO, total alkalinity, nutrient and biological conditions have been highlighted.

... 3 ref.

117. Sivakami, S., S. Ayyappam M.F. Rahman and B.V. Govind 1986. Central Inland Fisheries Research Institute Centre, Bangalore.

Biochemical composition of Cyprinus carpio (Linnaeus) cultured in cage in relation to maturity.

Indian J. Fish., 33(2): 180-187.

The paper gives the details of moisture, protein, lipid, glycogen and ash content in the muscle liver and gonad of Cyprinus carpio at different maturity stages. The protein, glycogen and mineral required for gonad development has been found to be mobilized from either muscle or liver in both the sexes. No relation between germ-building and fat content has been observed especially in females.

... 20 ref.



118. Soni, V.C. & Benson George 1986.  
 Dept. of Biosciences, Saurashtra University,  
 Rajkot-5.  
 Age determination and length-weight relation-  
 ship in the Mudskipper Boleophthalmus dentatus.  
Indian J. Fish., 33(2): 231-234.

Based on otolith studies Boleophthalmus dentatus  
 has been classified into 0-, 1-, and 2- year age groups as  
 far as the collection during July 1980 to January 1981 from  
 Jodia coast of Saurashtra is concerned. The length-weight  
 relationship for the fish has been given as log

$$\text{Log } W = -0.0823 + 2.759 \log L.$$

... 4 ref.

119. Srinath, M. 1986.  
 Central Marine Fisheries Research Institute,  
 Cochin.  
 A simple method of estimation of mortality.  
Indian J. Fish., 33(2): 235-237.

A simple method of estimation of mortality (2)  
 from length-frequency data has been proposed. The approach  
 also facilitates simultaneous estimation of standard error  
 of the estimate.

... 4 ref.

120. Subramanian, P. & S. Sambasivam 1988.  
 Central of Advanced Study in Marine Biology  
 Annamali University, Tamilnadu.  
 A perspective on mangrove economics.  
Ensblogy, 2(8): 34-38.

The variegated role of mangrove ecosystem in  
 the prosperity of coastal sea board community and the need  
 for conservation and management are presented here. The  
 details of resources and their utility has also been out-  
 lined.

... 9 ref.

121. Sukumaran, K.K. & K.N. Rajan 1986  
 Central Marine Fisheries Research Institute,  
 Mangalore.  
 On the biology of the penaeid Parapenaeopsis  
sculptilis (Heller) in the Bombay area.  
Indian J. Fish., 33(4): 440-449.

The paper deals with the growth rates of Parapenaeopsis sculptilis in respect of juveniles, males and females. Annual catch of the species has been recorded as 16.9 - 102.7 t at Sasson Docks and 3.6 - 16.9 t at Versova, while spawning was noticed round the year with two peaks. Female with matured ovary was 71-88 mm in length. Male dominated 78-90 mm size group and female dominated the rest.

... 9 ref.

122. Sukumaran, K.K. , K. Y. Telang & D. Thippeswamy 1986.  
Central Marine Fisheries Research Centre,  
Mangalore-575 001.  
On the fishery and biology of the crab  
Portunus sanguinolentus (Herbst) along  
the South Kanara coast.  
Indian J. Fish., 33(2): 188-200.

The paper deals with the fishery and biology of P. sanguinolentus available during Dec.-May along the South Kanara coast. Estimated catch at Mangalore during 1979-80 1980-81 & 1981-82 were 102.3, 100.2 and 57.0 t respectively and at Malpe during 1980-81 and 1981-82 were 65.9 t and 44.1 t. Carapace width and body weight relationship, spawning season, fecundity,  $L_{\infty}$ ,  $eV^k$  values etc. have also been dealt with in this paper.

... 15 ref.

123. <sup>1</sup>Sukumaran, N. & <sup>2</sup>M.N. Kutty 1987

1. Fisheries College, Tamil Nadu Agricultural University, Tuticorin-628 008, India.
2. Aquaculturist, FAO/UNDP Regional Aquaculture Training Centre, Port Harcourt, Nigeria.

Energy utilization in freshwater mullet, Rhinomugil corsula (Hamilton) under exercise.  
Proc. Indian Acad., Sci., 96(6): 705-714.

This paper deals with oxygen consumption, CO<sub>2</sub> release and respiratory quotient of Rhinomugil corsula in terms of duration and intensity of swimming exercise. Nitrogen excretion and quotients for NH<sub>3</sub> & N increased with duration & intensity of labour. An attempt has been made to estimate energy derivation from protein, carbohydrates and fat.

... 41 ref.



124. Surendranath, P., T. Ramesh Babu & K.V. Ramana Rao 1987.  
Dept. of Zoology, SV University PG Centre,  
Kavali-524 202, India.  
Toxicity of kelthane and its impact on  
behavioural responses of penaeid prawn  
Metapenaeus monoceros.  
Environ. & Ecol., 5(4): 782-785.

Describes static bioassay test of Metapenaeus monoceros by Kelthane treatment. LC<sub>50</sub> values are 0.259 and 0.156 ppm for 48 and 96 hours' exposure respectively. Response of the prawn varied from treatment to treatment.

... 9 ref.

125. Swaminath, M. & M.K.R. Nair 1983.  
Central Institute of Fisheries, Nautical  
and Engineering Training, Cochin-16.  
Recent results of tuna long lining in the  
Indian seas.  
J. mar. biol. India, 25(1&2): 113-117.

This paper reviews the development and growth of tuna long lining in India from 1960's, assistance of Japanese expert from FAO, trainings by CIFNET and discuss the recent trend of tuna and allied fishery of Indian seas. The paper also covers exploitation, resource, harvest post harvest technology, marketing etc. of tuna and allied fisheries.

... 5 ref.

126. Tandel, S.S. , R.P. Athalye & K.S. Gokhale 1986.  
B.N. Bandokhar College of Science, Thane.  
On the seasonal changes in food habit of  
Mugil cephalus of the Thane creek.  
Indian J. Fish., 33(3): 270-276.

Food habits of Mugil cephalus from the creek at Thane showed seasonal changes. The fish feed on Syllis sp. at a feeding rate of 14.38% during August to December and on diatoms mainly @ 62.55% during rest of the year. Average K and Kn are lower at high feeding than that at low feeding period. The maximum of K and Kn followed the same trend. Robustness is dependant on the type of food. DO showed relationship with muscle fats but feeding intensity did not.

... 15ref.

127. Thomas, Mary Pearl and P. Sita Rani Reddy 1986.  
 Dept. of Zoology, Madras Christian College  
 Tambaram, Madras-600 059.  
 On the endophragmal skeleton of prawns -  
 a taxonomical approach.  
Indian J. Fish., 33(1): 27-38.

Based on endophragmal skeleton of Penaeus japonicus, P. indicus, Metapenaeus dobsoni, M. monoceros, Parapenaeopsis stylifera, P. maxillipeda and Solenocera indica a taxonomic key has been proposed. These skeletons have been described in details and various structures have been identified by proposing several names.

128. Thomas, P.A. 1986.  
 V.R.C. of C.M.F.R.I., Vzhixjam.  
 Prawn of Goa with a note on the biology of  
Parapenaeopsis acclivirostris (alcock).  
Indian J. Fish., 33(3): 351-354.

Eight years observation showed that among discarded fraction of commercial landing in Goa, 28 species of prawns/shrimp occurred. Among these, Parapenaeopsis acclivirostris was obtained from a depth of 25-45 m during 1972-73. This paper deals with the biological aspect like length and growth, maturity and breeding and migration distribution etc. for the species.

... 4 ref.

129. Varghese, George & P. Shanmugham 1983.  
 Dept. of Fisheries, Lakshadweep.  
 The status of tuna fishery in Agathi Island in  
 Lakshadweep.  
J. mar. biol. Ass. India, 25(1&2): 190-201.

The paper narrates that Lakshadweep has organised fishery for Skipjack tuna (Katsuwonus pelamis) to catch 4000 t/yr which is about 20% of India's production. Mechanised boats (7.62 m) are operated to use pole & line for the catch. Out of four fishing Centres, Agathi Island Centre catches 46% of the total. Regarding this fishery the aspects like the seasonal abundance, CPUE, species composition, gonadial condition and feeding habits have also been discussed along with fish processing.



130. Vathheeswaran, S. & Syed Ahmad Ali 1986.  
Central Marine Fisheries Research Institute,  
Cochin-682 031.  
Evaluation of certain substances as growth  
promoting agents for the prawn Penaeus  
indicus.  
Indian J. Fish., 33(1): 95-105.

Oxytetracycline, ethyloestrenol, thyroid hormone, alfalfa extract, glucosamine, prawn shell and testosterone have been evaluated as growth promoting agents in the diet of P. indicus. Diet comprised casein, starch, sucrose, cod-liver oil, cholesterol, vitamins minerals and cellulose. Presenting the details of trials and composition have been discussed.

... 18 ref.

131. Verma, O.P. 1987.  
Plight of wetlands.  
PTI Science Service, 6(23): 9-10.

This is a feature on the threats for loss of Wetlands Worldwide which forms 6% of the total land surface. The details about important wetlands of the world and of India especially has been discussed and the need for their management has been highlighted. This includes a discussion of the Sundarbans also.

132. Vivekanandan E. & D.B. James 1986.  
Madras Research Centre of CMFR Institute,  
Madras-600 105.  
Population dynamics of Nemipterus japonicus  
(Bloch) in the trawling grounds off Madras.  
Indian J. Fish., 33(2): 145-154.

Reports that Nemipterus japonicus from trawling grounds off Madras matures at 145 mm length and exhibits spawning from June to March. The length-weight relationship has been shown as  $W = -4.8665 + 2.9661 \log L$ . The values for K,  $t_0$  and  $L_\infty$  have been estimated to be 1.004, 0.2257 and 305 mm respectively. The calculated M and F values for mortalities are 2.5254 and 0.4599. Annual stock (2300 t) and the standing crop (731 t) being higher than the estimated annual catch (336 t), the fishing effort can safely be increased without affecting the stock.

... 18 ref.

133. Wani, G.P. 1986.

Dept. of Zoology, Arts, Science and Commerce  
College, Chalisagaon (Jalgaon)-424 101,  
Maharashtra, India.

Toxicity of heavy metals to embryonic stages  
of Cyprinus carpio communis Linn.

Poll. res., 5(2): 47-51.

Fertilised eggs of C. carpio communis  
exposed to 10, 50, 70 and 100 ppb of Cd, Cu and Zn for  
108 hrs showed depression of developing egg survival,  
hatchability and hatching percentage with increase con-  
centrations of the heavy metals. Effect was more in the  
later part of embryonic development. Stunted growth,  
curved tail, dialation of pericardial sac, circulatory  
failure, deformity in vertabrae, malformation of fins  
head region and appearance of blisters were the results  
of exposure.

...21 ref.

134. Zacharia, P.U. 1987.

C.M.F.R.I. Mangalore.

Fish eggs and larval studies their impor-  
tance to fisheries and aquaculture in  
India.

Green & Glory., 2(1): 34-35.

Reports how eggs and larval studies are  
used in estimating fish stock abundance or as indicator  
for pollution. Laboratory rearing of fish larvae may be  
for inland aquaculture, seafarming, selective breeding,  
physiological work or other purposes.

... 1 ref.





## AUTHOR INDEX

Every author's name appearing in the original article is listed alphabetically, including corporate bodies (Societies, organisations etc.), whether occurring as a single or multiple words. (Reference is given to the serial no. of the entry).

Agarwal, G.P.	...	92
Alagaraja, K.	...	1
Ali, Syed Ahmad	...	130
Anon	...	2, 3
Athalye, R.P.	...	126
Awasthi, Ajoy K.	...	4
Ayyappan, S.	...	117
Babu, T. Ramesh	...	103, 124
Badrudeen, M.	...	35
Banerjee, Subrata	...	5
Banerjee, V.	...	5
Banik, S.	...	15, 82
Beena, S.	...	6
Beevi, M. Razia	...	7
Bharathan, Geeta	...	8
Bhowel, S.K.	...	9
Bhowmick, M.L.	...	11
Chakraburty, A.K.	...	9
Chakrabarti, P.	...	10
Chakraborti, R.K.	...	11
Chakraborty, S.K.	...	12
Chaudhury, A.	...	25
Chennubhotla, V.S.K.	...	13
Chetty, C. Sreeramulu	...	99
Dandarathimath	...	50
Dasmahapatra, A.K.	...	14
Das, P.	...	68
Datta Munshi, J.S.	...	83, 107
Datta, N.C.	...	15
Davis, T.A.	...	16
De, D.K.	...	17
Desai, Prakash, V.	...	18, 19
Devaraj, M.	...	20
Dhar, Bhabani;	...	9



# A-II

George, Benson	...	118
Ghatak, D.B.	...	34
Ghosh, Kakali	...	36
Ghosh, S.	...	25
Ghosh, T.K.	...	26, 27
Ghouselasam, S.	...	103
Goel, P.K.	...	28
Gokhale, K.S.	...	126
Gopinathan, C.P.	...	29
Govind, B.V.	...	117
Guha, Dhriti	...	30
Gupta, R.A.	...	114
Gupta, T.R.C.	...	64
Habibnia, B.A.	...	31
Halder, D.D.	...	11
Hameed, M. Shahul	...	32, 33
Hariharan, V.	...	102
Hussain, Md. M.	...	34
Jagadis, I.	...	52
James, D.B.	...	132
James, P.S.B.R.	...	35
Jana, Sasadhar	...	36
Jana, T.K.	...	25
Jayabalan, N.	...	37
Jayaprakash, A.A.	...	75
Jayaraman, R.	...	38
Jayasanhar, P.	...	39
Joseph, Antony	...	40
Joshi, S.N.	...	41
Kagwade, P.V.	...	12
Kaliamuthu, S.	...	13, 42
Kaliaperumal, N.	...	13, 42
Kasim, H. Mohamad	...	43, 44
Kannupandi, T.	...	53
Khan, A.K.	...	45
Khan, Iqbal A.	...	46
Khan, Mohammad Zafar	...	47
Khatavkar, S.D.	...	28
Khillare, Y.K.	...	48
Konar, S.K.	...	34, 84

## A-III

Kongovi, R.R.	...	50
Krishna Kumar, P.K.	...	51
Krishnamoorthi, B.	...	52
Krishnan, T.	...	53
Krishnaswamy, S.	...	58
Kuldip Kumar	...	63
Kulkarni, A.Y.	...	28
Kumari, K.	...	54
Kumar Kuldip	...	55
Kunhikoka, K.K.	...	65
Kunwar, Gopal Krishna	...	83
Kurup, N. Surendranath	...	56
Kutty, M.N.	...	123
Lakshmipathi, V.	...	106
Lam, T.J.	...	105
Laxminarayana, A.	...	72, 73
Lazarus, S.	...	57
Mahadevan, Anandhavalli	...	58
Maiti, S.S.	...	108
Mane, U.H.	...	69
Manikyala, Rao D.	...	98
Manisseri, Mary, K.	...	59
Mannikeri, M.S.	...	31
Mansuri, A.P.	...	85
Markande, S.J.	...	50
Mathew, K.J.	...	60
Meddah, A.K.	...	14
Menon, N. Gopinatha	...	61
Menon, N.R.	...	64
Misra, A.	...	62
Mitra, Krishna	...	63
Mohamed, K.H.	...	72, 73
Mohammad Zafarkhan	...	44
Mohan, C.V.	...	64
Mohan, Madan	...	65
Mollalv, M.F.A.	...	66
Molly, M.P.	...	67
Mondal, C.R.	...	108
Moorthy K. Sreenivasa	...	99
Mukherjee, Dilip	...	30
Mukhopadhyay, P.K.	...	68
Muley, P.V.	...	69
Murty, V. Sriramachandra	...	70, 71
Muthu, M.S.	...	72, 73



## A-IV

Nagabhushanam, R.	...	45
Naidu, B.P.	...	74
Naidu, K. Rajendra Prasad	...	74
Nair, K.V. Somasekharan	...	75
Nair, M.K.R.	...	125
Nair, M.R.	...	76
Nair, P.V.R.	...	77
Nair, S.R. Sreekumaran	...	78
Naluchinnapan, I	...	79
Nanaware, S.G.	...	80
Nandakumaran, K.	...	57
Nandi, N.C.	...	62
Naomi, T.S.	...	81
Nath, D.	...	17
Ninawe, A.	...	82
Panda, P.	...	86
Pandey, Anita	...	83
Pandian, S.K.	...	73
Panigrahi, A.K.	...	84
Patel, R.I.	...	85
Patil, M.U.	...	45
Patil, S.G.	...	86
Paulose, P.V.	...	87
Paulpandian, A.L.	...	33
Paul Raj, Samuel	...	88
Pearl, Thomas Mary	...	127
Philipose, K.K.	...	89
Pillai, C.S. Gopinath	...	65
Pillai, N.K. Sasidharan	...	32
Pillai, N.N.	...	73
Pillai, S. Krishna	...	90
Pillai, V.K.	...	77
Ponnuchamy, R.	...	91
Prakash, Shree	...	92
Pramoda Kumari, J.	...	74
Prasad, G.V.R.	...	93
Prasad, M.N.	...	85
Radhakrishnan, S.	...	7
Rahman, M.F.	...	117
Rajan, K.N.	...	121
Ramakrishniah, M.	...	94
Ramalingam, J.R.	...	13, 42
Ramanibai, P.S.	...	95

## A-V

Ramaswamy, M.	...	96
Ram, Rajnarayan	...	97
Rao, B. Malla	...	104
Rao, K. Sambasiva	...	45
Rao, K. Seshagiri	...	99
Rao, K. Srinivasa	...	98
Rao, K.V.N.	...	100
Rao, K.V. Ramana	...	124, 103
Rao, S. Seeta Ram	...	100
Ravichandran, S.	...	95
Ravindran, K.	...	101
Reddy, B. Kasi	...	99
Reddy, H.R. Venkataswamy	...	102
Reddy, M. Srinivasulu	...	103
Reddy, M. Vikram	...	104
Reddy, P.K.	...	105
Reddy, P. Sita Rami	...	127
Reddy, S. Ravichandra	...	91
Reddy, T. Mahender	...	106
Rex Harold	...	80
Roy, P.K.	...	107
Roy, R.N.	...	108
Sabiha, Alam	...	45
Sambasivam, S.	...	120
Sampath, K.	...	109
Sarkar, S.K.	...	110
Sarojini, R.	...	45
Sarwar, S.G.	...	111
Sasikala, S.L.	...	112
Sathyanesan, A.G.	...	97
Satya, Mohan K.	...	113
Saxena, S.K.	...	54
Selvaraj, M.	...	42
Sen, P.R.	...	17
Shakuntala, Katre	...	91
Shanmugham, P.	...	129
Shree Prakash	...	114
Shyamsunder	...	115
Singh, B.N.	...	25
Singh, R.K.	...	116
Singh, R.P.	...	54
Singh, Smita	...	4
Sinha, G.M.	...	10
Sivakami, S.	...	117



A-IVI

Soni, V.C.	...	40, 118
Srinath, M.	...	119
Srithar, R.T.	...	109
Subramoniam, T.	...	112
Subramanian, P.	...	120
Sukumaran, K.K.	...	121, 122
Sukumaran, M.N.	...	123
Surendranath, P.	...	124
Swami, K.S.	...	99, 101
Swaminath, M.	...	125
Tandel, S.S.	...	126
Telang, K.Y.	...	122
Thippeswamy, D.	...	122
Thomas, P.A.	...	128
Trivedy, R.K.	...	28
Varghese, George	...	129
Vathheeswaran, S.	...	130
Venkatesh, B.	...	68
Verma, O.P.	...	131
Viswaranjan, S.	...	6
Vivekanandan, B.	...	132
Wagh, S.B.	...	49
Wani, G.P.	...	133
Zacharia, P.U.	...	134
Zutshi, D.P.	...	111

S-I

III. SUBJECT INDEX

(Subject headings with their sub-headings are listed alphabetically  
Reference is given to the serial number of the entry).

ANATOMY

Fishes ... 10, 83, 87, 127

AQUACULTURE SYSTEMS ... 117

AQUACULTURE SYSTEM PREPARATION & MANAGEMENT ... 63, 80, 96, 108, 110

AQUATIC PLANTS ... 13, 42, 100

BENTHOS ... 55, 104

BIOCHEMISTRY ... 5, 14, 21, 27, 30, 48, 49, 68,  
69, 84, 96, 99, 101, 105, 106,  
112, 117, 123.

BIOLOGY OF AQUATIC ANIMALS

a. Food & feeding habits ... 33, 65, 94, 126

b. Breeding and spawning ... 20, 35, 37, 41, 52, 57, 60, 65,  
66, 91, 94, 96, 115, 121, 128

c. Embryology and early development ... 53, 60, 133

d. Age & growth ... 40, 52, 57, 61, 65, 70, 71,  
85, 94, 98, 114, 118, 121, 122,  
128

BREEDING OF AQUATIC ANIMALS

a. Induced Breeding ... 72, 78



CULTURE OF AQUATIC ANIMALS	...	
Fish food organisms	...	2, 8, 29
Brackishwater Aquaculture	...	22, 38
Mariculture	...	42, 73, 89
Freshwater Aquaculture	...	79
Spawn production	...	134
DISTRIBUTION		
Fishes	...	92
Crustaceans	...	31, 32, 59
ECOLOGY		
Reservoirs	...	3, 28, 46
Lakes	...	15, 28
Estuaries	...	25
Ponds	...	28, 95, 116
Tank	...	28
River	...	58
Sea	...	77
FISHERIES		
Sea	...	44, 56, 59, 70, 71, 75, 90, 92, 122, 125, 128, 129, 132
Reservoirs	...	94
FISHERIES MANAGEMENT	...	3
FISHERY ECONOMICS	...	120
FISHERY STATISTICS	...	1, 47, 70, 71, 119, 132
FISHING CRAFTS, GEARS & AIDS	...	44, 56, 70, 71
FISH PATHOLOGY	...	36, 62, 82
GENETICS	...	12
HYDROLOGY	...	113

# S-III

INSTRUMENTATION	...	8
MICROBIOLOGY	...	82
MISCELLANEOUS REPORTS	...	23, 131
MORPHOLOGY		
Molluscs	...	16
NUTRITION	...	109, 130
PALAEONTOLOGY	...	93
PERIPHYTON	...	15, 111
PHYSIOLOGY		
a. Fishes	...	6, 7, 24, 26, 27, 34, 64, 66, 74, 91, 96, 97, 99, 105, 107, 124, 126
b. Crustaceans	...	11, 34, 39, 43, 45, 103
c. Molluscs	...	33, 34, 69
PLANKTON		
a. Zooplankton	...	24, 31, 32, 34, 60, 81
b. Phytoplankton	...	4, 18
POST HARVEST TECHNOLOGY	...	67, 76
PREDATORS & PREDATION CONTROL	...	63, 103
SOIL CHEMISTRY	...	54, 102
TRANSPORTATION OF FISHERY PRODUCTS	...	17
WATER POLLUTION	...	4, 6, 7, 9, 18, 19, 24, 26, 27, 34, 36, 39, 45, 48, 50 51, 58, 64, 69, 74, 84, 86, 87, 88, 96, 97, 99, 101, 103, 124, 133





TAXONOMIC INDEX

<u>Amblypharyngodon mola</u>	...	106
<u>Barbus stigma</u>	...	26, 27, 48
<u>Barbus ticto</u>	...	49
<u>Bregmaceros maclellandi</u>	...	90
<u>Boleophthalmus dentatus</u>	...	118
<u>Caranx sp.</u>	...	90
<u>Caridina weberi</u>	...	91
<u>Catla catla</u>	...	114
<u>Channa punctatus</u>	...	97
<u>Chirocentras sp.</u>	...	90
<u>Chromiscaeruleus</u>	...	65
<u>Cirrhinus mrigala</u>	...	64, 107, 114
<u>Clarias batrachus</u>	...	5, 48, 68
<u>Clarias macrocephalus</u>	...	66
<u>Coilia sp.</u>	...	90
<u>Colisa lalia</u>	...	105
<u>Cybbium sp.</u>	...	90
<u>Cyprinus carpio</u>	...	6, 30, 74, 110, 117, 133
<u>Etroplus suratensis</u>	...	21, 57
<u>Gazza achlamys</u>	...	35
<u>Gambusia affinis</u>	...	87
<u>Gazza minuta</u>	...	35
<u>Harpodon nehereus</u>	...	47
<u>Heteropneustes fossilis</u>	...	5, 14
<u>Hilsa sp.</u>	...	90
<u>Hilsa ilisha</u>	...	17, 83
<u>Johnius belangerii</u>	...	12
<u>Johnius carutta</u>	...	70
<u>Katsuwonus pelamis</u>	...	129
<u>Labeo gonius</u>	...	41
<u>Labeo rohita</u>	...	83, 114
<u>Lactarias sp.</u>	...	90
<u>Leiognathus bindus</u>	...	35, 71
<u>Leiognathus blochii</u>	...	35
<u>Leiognathus brevirostris</u>	...	35
<u>Leiognathus daura</u>	...	35



## T-II

<u>Leiognathus dussumieri</u>	...	35
<u>Leiognathus equulus</u>	...	35
<u>Leiognathus fasciatus</u>	...	35
<u>Leiognathus jonesi</u>	...	35
<u>Leiognathus leuciscus</u>	...	35
<u>Leiognathus lineolatus</u>	...	35
<u>Leiognathus smithursti</u>	...	35
<u>Leiognathus splendens</u>	...	35, 37
<u>Macrobrachium birmanicum choprai</u>	...	92
<u>Macrobrachium lamarrei</u>	...	91
<u>Macrobrachium lanchesteri</u>	...	91
<u>Macrobrachium malcolmsonii</u>	...	79
<u>Metapenaeus affinis</u>	...	56
<u>Metapenaeus dobsoni</u>	...	56, 127
<u>Metapenaeus kutchensis</u>	...	40
<u>Metapenaeus monoceros</u>	...	56, 103, 112, 124, 127
<u>Mugil cephalus</u>	...	126
<u>Mystus vittatus</u>	...	10, 48
<u>Nemipterus sp.</u>	...	90
<u>Nemipterus japonicus</u>	...	75, 98, 132
<u>Nemipterus mesoprion</u>	...	75
<u>Nibea semisulcatus</u>	...	12
<u>Oreochromis mossambicus</u>	...	7, 24, 34, 80, 84, 96, 99, 101
<u>Pangasius pangasius</u>	...	94
<u>Parapenaeopsis acclivirostris</u>	...	128
<u>Parapenaeopsis maxillipeda</u>	...	127
<u>Parapenaeopsis sculptilis</u>	...	121
<u>Parapenaeopsis stylifera</u>	...	56, 127
<u>Penaeus indicus</u>	...	39, 56, 72, 73, 82, 112, 127, 130
<u>Penaeus japonicus</u>	...	127
<u>Penaeus merguensis</u>	...	78
<u>Penaeus monodon</u>	...	11, 22, 109
<u>Penaeus penicillatus</u>	...	85
<u>Penaeus semisulcates</u>	...	59
<u>Phychocheilus sp.</u>	...	48
<u>Polynemus sp.</u>	...	90
<u>Rhinomugil corsula</u>	...	123
<u>Rhizoprionodon acutus</u>	...	52
<u>Rita rita</u>	...	5

# T-III

<u>Schizothorax longipinnis</u>	...	115
<u>Schizothorax richardsonii</u>	...	41
<u>Scomberomorus linedatus</u>	...	20
<u>Secutor ruconius</u>	...	35
<u>Solenocerca indica</u>	...	127
<u>Tachysurus thalassi</u>	...	61
<u>Trichiurus</u> sp.	...	90
<u>Upeneus</u> sp.	...	90





## SERIAL INDEX

<u>Aquaworld</u> , <u>11</u> (6), 1987	...	3, 23
<u>Bangladesh J. Fish</u> , <u>2-5</u> (1-2), 1982	...	14
<u>Bull Cent Inland Fish Res. Inst.</u> , Barrackpore, No.54, 1988	...	63
<u>Cur Sci.</u> , <u>57</u> (1), 1988	...	31, 106
<u>56</u> (24), 1987	...	93
<u>Encology</u> , <u>2</u> (7), 1987	...	50
<u>2</u> (8), 1988	...	120
<u>Environ. &amp; Ecol.</u> , <u>5</u> (4), 1987	...	4, 5, 6, 24, 26, 34, 36, 48, 49, 69, 74, 84, 96, 101, 103, 108, 124
<u>Fish. Eng. Int.</u> , <u>15</u> (3), 1988	...	2
<u>Fishing Chimes</u> , <u>4</u> (11), 1985	...	22, 79
<u>8</u> (9), 1988	...	38
<u>Green &amp; Glory</u> , <u>2</u> (1),	...	39, 51, 67, 89, 134
<u>Indian J. Environ. Hlth.</u> , <u>29</u> (1), 1987	...	9, 99
<u>Indian J. Exp. biol.</u> , <u>25</u> (12), 1987	...	30
<u>25</u> (10), 1987	...	97
<u>Indian J. Fish.</u> , <u>33</u> (2), 1986	...	8, 21, 37, 44, 62, 70, 113, 72, 115, 117, 118, 119, 122, 132
<u>33</u> (4), 1986	...	11, 17, 29, 32, 42, 52, 59, 61, 65, 98, 121
<u>33</u> (1), 1986	...	12, 13, 35, 40, 43, 46, 64, 66, 73, 75, 85, 102, 114, 127, 130
<u>33</u> (3), 1986	...	20, 47, 56, 57, 68, 71, 81, 90, 92, 94, 126, 128
<u>J. Aqua Trop.</u> , <u>2</u> , 1987	...	82, 105, 109
<u>J. Exp. Mar. Biol. Ecol.</u> , <u>113</u> (2), 1987	...	112
<u>J. mar. biol. Ass. India</u> , <u>25</u> (1-2), 1983	...	1, 60, 76, 77, 125, 129
<u>Mahasagar</u> , <u>20</u> (3), 1987	...	25, 53, 78



<u>Poll. res.</u> , <u>6</u> (2), 1987	...	18, 19, 45, 95, 104, 113
<u>5</u> (2), 1986	...	27, 28, 58, 86, 88, 133
<u>6</u> (3-4), 1987	...	80
<u>Proc. Indian Acad. Sci.</u> , <u>96</u> (6), 1987	...	7, 33, 91, 123
<u>97</u> (1), 1988	...	110
<u>Proc. Indian natn. Sci. Acad.</u> ,		
<u>53</u> (4), 1987	...	10, 16, 107
<u>53</u> (3), 1987	...	15, 54, 55, 83, 87, 100, 111
<u>PTI Science Service.</u> , <u>6</u> (23), 1987	...	131
<u>Sci. &amp; Cult.</u> , <u>53</u> (9), 1987	...	41

\*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*  
 \*





